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Editorial

Evidence You Can Use: Practical Research Questions from Pakistani Operating Rooms

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Introduction

Nowadays, evidence-based practice forms the foundation of clinical decision-making. In this era of evidence-based medical practice, research questions often arise from day-to-day problems arising on the operating table and at the bedside. As managing trauma, burns, congenital anomalies, post-tumour excision defects and aesthetic demands pose a significant challenge in the local context, the opportunities for clinically relevant research are enormous.

In international plastic surgery literature, the gap between high-level evidence and the questions that matter to practitioners is getting wider. Due to the scarcity of randomized controlled trials and systematic reviews in the subspecialties of plastic surgery, many clinical uncertainties remain unresolved. The lack of contribution of plastic surgery research from low- and middle-income countries (LMICs), including Pakistan, remains a challenge. Although nations such as India and Egypt dominate LMIC publication lists, contributions from Pakistan are noteworthy yet still disproportionate to the level of clinical expertise and clinical need. Major barriers to this underrepresentation of Pakistan in high-impact-factor journals is lack of infrastructure, mentorship, statistical support and access to publishing avenues One way to narrow this gap is to follow the dictum "test your observation". Therefore, to promote the evidence based patient care, our focus should be on research questions, arising from daily bed-side activities and operation room. These include, but are not limited to:

- What are the outcomes and cost-effectiveness of common reconstructive procedures in burn care in Pakistani settings?
- How do different flap strategies compare for local trauma indications in terms of healing, function, and patient-reported outcomes?
- In congenital anomalies such as cleft lip and palate, what are the most common complications in local surgical pathways, and how can standard audits improve protocols?
- What is the cost-effectiveness of low-cost imaging or telemedicine follow-ups for postoperative monitoring?

Investigating such research questions may not be always dependant on large grant funding, although it demads consistency, standard approach of data collection and honest reporting of complications and limitations.

IDEAL (idea, Development, Exploration, Assessment, Long term study) framework is a reliable tool to design the innovative research studies in the field of plastic surgery. Pakistani journal of plastic surgery has a pivotal role in the field if research by advocating the evidence in local context, mentoring authors in designing their research studies and highlighting the importance of clinical oriented studies to improve the surgical practice in our country.

Let this editorial be a call to action: ask questions grounded in your operating room, study them with methodological care, and publish evidence that truly matters to your peers and patients.

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Research Article

Functional Morbidity and Surgical Outcomes of Tongue Flap Repair for Cleft Palate Fistulas

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Abstract

Background: Though cleft palate repair procedures have become more effective, fistula formation is a common occurrence, not just due to the technique but sometimes due to poor tissue quality. Although local flaps are commonly used for fistula closure, their application may not be feasible in certain cases due to the size and location of the fistula. The use of tongue flaps is preferred over other tissues for the closure of anterior palatal fistulae due to their central location and reliability.

Objectives: This research aimed to evaluate the role of the tongue flap in anterior palatal fistula repair.

Methodology: Patients admitted between June 2013 and December 2016 who had a palatal fistula and was repaired with a tongue flap were included in the research. The location of fistula, its size and complications were noted. After three weeks, the flaps were splitted, and the final inset was completed.

Results: A total of forty-four patients were included in the study. In all forty-four instances, the fistula was positioned anteriorly. The fistulae ranged in size between 1 cm to 3.5 cm. None of the patients had flap necrosis. One patient had bleeding, and in one instance involved a dehiscence of the flap that was restitched. None of our patients had functional problems with the tongue. 75% of people reported satisfactory.

Conclusion: Despite the two-staged surgery, the tongue flap continues to be the preferred and reliable flap for treating extremely complex and demanding anterior palatal fistulae.

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Keywords | cleft palate, tongue flap, speech, fistula repair, patient satisfaction.

Introduction

Cleft palate is one of the more common congenital abnormalities affecting the orofacial region and occurs due to failure of fusion of the palatal shelves during embryonic development. Surgical repair is required to restore essential functions, particularly speech, swallowing, and normal maxillofacial growth. Despite ongoing refinements in surgical techniques, the development of postoperative palatal fistula remains a persistent problem in clinical practice, with reported incidence rates ranging from 4% to 35%.[1]

Palatal fistulas create an abnormal communication between the oral and nasal cavities and may result in several functional difficulties, including nasal regurgitation of food and liquids, impaired speech, hypernasality, and resonance disorders.[2] Multiple options has been described in the literature for fistula closure and includes local, regional and free flaps. Among these reconstruction options, the use of tongue flap has become popular. The reason behind this is the reliable blood supply and durability of the tissue for the fistula closure.[3,4]

Though the use of tongue flap is becoming popular, there

are concerns regarding the donor site. During the post op period the immobilization of the tongue can temporarily affect the speech, deglutition and oral hygiene.[5,6] This aspect of tongue flap was not studied by many published articles, most of the studies mentioned the flap survival and fistula closure only. There is a research gap regarding the donor site morbidity of tongue flap.[7,8]

The rationale of this study was to review the results of this technique performed at a tertiary care center. The review also included donor site characteristic including donor site healing, speech and deglutition. Secondary outcomes studied were fistula characteristics, including location, size and then fistula closure. The outcomes influence the decision making to improve the end results of this procedure for fistula closure.[9,10]

Material and methods

This retrospective study was conducted at tertiary care hospital between June 2013 to December 2016. The study included 44 patients who underwent cleft palate fistula closure with use of tongue flap. This study looked into the surgical and functional outcome including tongue movement, swallowing, taste and improvement in nasal regurgitation.

The medical record was reviewed to obtain the demographic date and operative notes. Other details obtained were fistula assessment, operative details, surgical outcome and complications. Only patients with complete and accessible medical records were included in the analysis. Patients who had previously undergone alternative surgical procedures for fistula repair or those with incomplete documentation were excluded from the study to ensure consistency and reliability of the collected data.

Patients with collapsed maxillary arches underwent orthodontic arch expansion initially. Turn-over flaps from the fistula borders were used to reconstruct the nasal lining, while tongue flaps provided the oral lining, as shown in Figure 1. The flap's length was modified to fit into the defect and an extra 1 cm was taken to allow rotation of the flap in the defect. It was not allowed to extend past the circumvallate papillae. Although the flap's breadth fluctuated depending on the extent of the fistula, it never exceeded two-thirds of the tongue's width as shown in Figure 1. To preserve the underlying submucosal plexus, flaps were elevated such that up to 5-7 mm of the muscle depth was always removed. To preserve the vascularity of the flap, the donor site was mostly closed with absorbable sutures. Care was taken not to close it too tightly around the pedicle. The flap edges were properly approximated to the mucoperiosteal borders from edge to edge. The division and insetting has to be done on 9th postop day in one case because one of the border was bleeding, although the tongue flaps were typically split after 21 days postoperatively.

Figure 1: *Design of the tongue flap so as not to extend past the circumvallate papillae(A), primary donor site closure sustaining the flap pedicle's vascularity, up to two-thirds of the breadth of the tongue can fit inside the flap's depth, which also includes a muscle thickness of 5-7 mm(B), post-opView of the tongue flap. The flap is flushed with the palatal tissues (C).*

Results

A total of 44 patients underwent tongue flap repair for cleft palate fistula. The age range was 2.5 to 26 years, with a mean age of 12.3 ± 5.8 years, as depicted in figure 2. Gender distribution showed that 55% (n = 24) were male, while 45% (n = 20) were female (figure 3).

In terms of cleft type, 65.9% (n = 29) of patients had unilateral cleft lip and palate, while 34.1% (n = 15) had bilateral cleft lip and palate (Fig 4). The fistula size ranged from 1 cm to 3.5 cm, with the majority (59.1%, n = 26) measuring between 2 -2.5 cm (Fig 5).

Post surgery donor site healing was normal with no long term healing issues. Patients achieved normal tongue movement, speech and articulation. Deglutition and swallowing reflexes were normal after the procedure. Specialized function like taste were remain intact. There were reported difficulties in eating and swallowing in initial few days and improved after third day. There were no documentation of any long term diet

changes or nasogastric feeding.

The fistula closure was achieved in all the cases. There were no recurrence of fistula during follow up. Documented complications were less, one patient (2.3%) had postoperative bleeding which was treated conservatively. Another patient (2.3%) had detachment of distal end of the flap which did not require any restitching and healed on its own. All the patients had improvement in nasal regurgitation and about 75% had improvement is hypernasality.

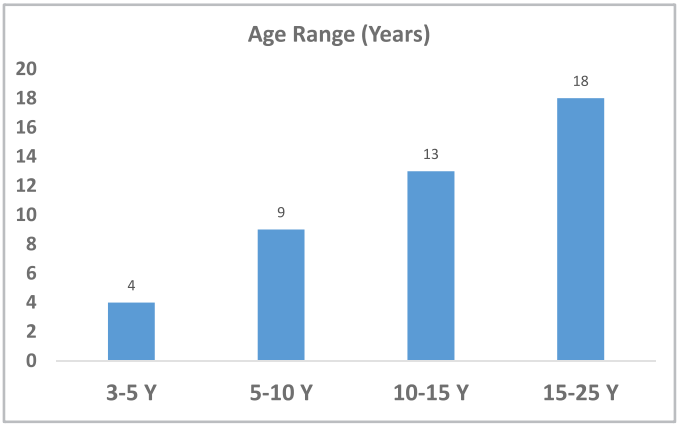

Figure 2: *The Age range of patients. (n=44)*

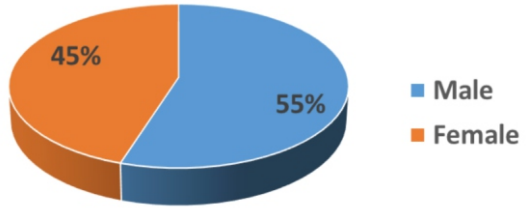

Figure 3: *Gender distribution of palatal fistulae*

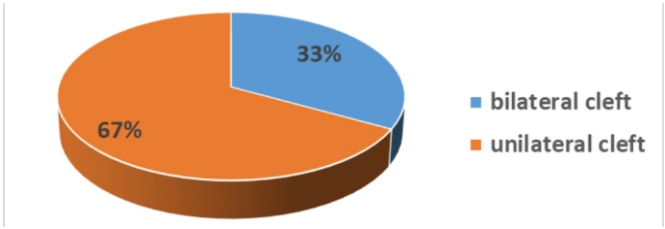

Figure 4: *Anterior palatal fistula distribution in unilateral and bilateral cleft instances*

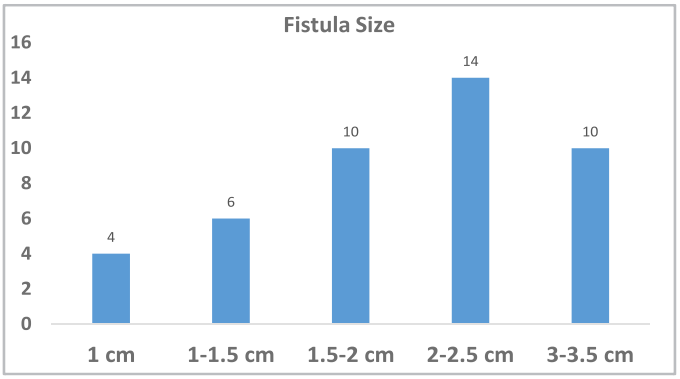

Figure 5: *Size range of anterior palatal fistulas*

Discussion

The tongue flap remains a reliable reconstructive option for managing complex palatal fistulas, particularly in situations where local tissue is limited or has already been compromised by previous surgery. From our experience, this has been especially true in patients with large anterior defects. Since its original description by Guerrero-Santos and Altamirano for the repair of hard palate fistulae, the technique has been valued for its strong vascular supply from the lingual artery and its ability to provide well-perfused tissue for difficult defects, while maintaining low donor site morbidity.[12] In the present series, complete fistula closure was achieved in all patients, which, in our view, further supports the dependability of this method. These results are generally in line with previously reported success rates in the literature, which typically range between 85% and 95.5%.[13]

One of the main concerns with tongue flap reconstruction has always been possible donor site morbidity, particularly its effect on speech, swallowing, and sensory function. In our cohort, however, no patient developed any long-term impairment in tongue movement or function. Swallowing reflexes remained normal, and taste perception was preserved in all cases, which suggests that donor site morbidity with this technique is minimal.

In our study, patients report difficulty in feeding and swallowing during early postoperative period but that is usually self limiting and no patient required nasogastric tube feeding. This observation is consistent with previous literature. Keeping the flap thickness between 5 to 7 mm is important in maintaining articulation and swallowing.[14] Another important finding in our study was that most of our patients were younger than five years of age, and they still did not require tube feeding. This fact highlights that this technique is usefully in young children as well.

Some surgeons recommend additional immobilization of tongue by doing jaw fixation or stitching the tongue to reduce tongue movements. In our group of patients, we did not follow these manoeuvres. The patients had good healing, the logical reason for this would be less tongue movement by patients during early postoperative period due to discomfort on the movements. This suggests that routine fixation is not required and careful flap dissection and insetting are important consideration to achieve good healing and fistula closure.[16]

All patients in our study achieve complete fistula closure which clearly shows that the tongue flap is a robust option for these large and complex defects where local

flaps are not sufficient.[19] This shows that good surgical technique, tension free closure and meticulous flap insetting improve the outcome. Flap division and insetting were performed at three weeks. Flap outcome was assessed for healing, fistula closure and complications. Complications reported in our study were rare. One patient had bleeding, which was treated conservatively. One patient had partial detachment of the flap, which healed without any surgical intervention. Our study results support the literature finding that this flap is safe and reliable method for palatal fistula closure.[17]

The main aim of fistula closure was not just wound closure but restoration of normal function. In our study patients, nasal regurgitation and speech were improved. This shows the importance of separating the oral and nasal cavities.[3,4] The improvement in speech and nasal regurgitation leads to improved functions which in turn improve the patient's confidence. This improves the social interaction and especially in younger patients who are still developing socially.[20,21]

Despite the favourable outcome of the study there are some limitations. As this study is a retrospective study that relied on the existing medical records. The sample size is smaller though it is similar to the existing literature. The other limitation is the lack of comparison group, which makes it difficult to say that tongue flap is superior to other reconstructive options. This warrants further prospective comparative study to have clear information regarding the comparison of different surgical options.

Conclusion

This study concluded that the tongue flap is a reliable option for large palatal fistula with minimum donor site morbidity. This option is particularly reliable for anterior fistulas where the local options are limited or unable to cover the defect.

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Conflict of interest: None.

Author's contribution:

Ahmad Saeed: Drafting of work, Conception and design of the study. Data Collection and analysis.

Farrukh Aslam Khalid: Conception and design of the study, data collection, analysis and interpretation, Drafting the work, Final approval of the version to be published and accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Junaid Ahmad: Study design, drafting of work, Data Collection and analysis

Sania Ahmad: Data collection, Article Editing and Manuscript Revision,

Muhammad Amin: Article Editing, Manuscript Revision analysis and interpretation of data

Bushra Akram: Study design , Data Collection, Data Interpretation and Analysis

All authors meet the ICMJE authorship criteria and agree to be accountable for all aspects of the work, ensuring the accuracy and integrity of the research.

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Research Article

Revisiting Pedicled Medial Arm Flap for Soft Tissue Defects Around Elbow in Pediatric Patients

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Abstract

Elbow defects present intricate challenges in reconstructive surgery due to the joint's complex anatomy and functional requirements.

Objective: Objective of this study is to investigate the efficacy of perforator-based medial arm flap reconstruction for anterior elbow defects that circumvent the injury of the main source vessel in pediatric patients.

Methodology: This prospective study was done in Mayo Burn & Reconstructive Surgery department from November 2022 to November 2023. Pediatric patients requiring reconstruction of small to medium sized soft tissue defects around the elbow were included. The study describes the surgical technique, the anatomy of perforators, outcomes and challenges associated with this approach.

Results: 15 consecutive patients were treated with perforator based pedicled medial arm flap. Results showed a consistently located perforator near the medial epicondyle, enabling successful flap harvesting and viability. Post-operative outcomes revealed high flap survival rates with minimal complications.

Conclusion: The technique offers a reliable option for elbow defect coverage due to the consistent location of the perforator.

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Keywords | Medial Arm Flap, Perforator flap, Elbow wounds.

Introduction

Elbow defects in pediatric patients pose a unique reconstructive challenge owing to its intricate anatomy and functional requirements. The reconstructive aim for coverage of soft tissue defects of anterior elbow is a pliable flap coverage that allows adequate coverage of neurovascular structures and passive range of motion.[1] Pediatric patients do not comply well with physiotherapy regimes, hence total coverage by a supple flap or interposition flap with split thickness skin graft to reconstruct the soft tissue defect is better.[2,3] Perforator flaps have gained popularity as they cause minimal donor site morbidity and allow easily elevation of the flaps for secondary bony or tendon work.[4,5]

The reverse medial arm flap can be based on the superior ulnar collateral artery or on the perforators from inferior ulnar collateral artery and brachial artery.[6,7] Reverse or distally based medial arm flap when based on ulnar recurrent arteries requires the division of the artery proximally which limits the usefulness of the flap if there is a distal injury around the origin of the pedicle.[3] The reverse flap's proximity to the defect site allows for a more anatomically congruent reconstruction, preserving joint function. However, due to its difficult dissection and dubious perfusion in distal trauma, it has not gained popularity.[8] The presence of a single, reliable perforator can potentially overcome this debacle, but existing literature only points to the presence of perforators in distal arm and does not identify presence and precise location of a single reliable perforator in this area. Perforators in this area are usually septo-cutaneous giving off muscular branches. We present our

study that explores the reconstruction of soft tissue defects around elbow with perforator based medial arm flap in pediatric patients, shedding light on our surgical technique and anatomy of the single consistent perforator closest to the elbow to allow large arc of rotation.

Methodology

After approval by ethical committee of the institution, this prospective study was done in Mayo Burn & Reconstructive Surgery Department from November 2022 to November 2023. We included patients between age 2 years to 12 years, both male and female, with small to medium soft tissue defects over anterior and posterior surfaces of the elbow amenable to closure with medial arm flap with or without the skin graft. We excluded patients with large defects, uncontrolled comorbidities and who had injury to the medial arm skin. Patients' demographics, surgical technique, perforator location and its origin, flap characteristics, flap survival and complications were assessed & recorded. Patients were followed up for up to 3 months.

Technique:

Patients were placed in supine position with shoulder abducted, externally rotated and elbow flexed at 90 degrees. An axis was marked extending from medial epicondyle along the posterior axillary fold till the axillary apex. An 8Hz hand-held Doppler Ultrasound probe was used to map the perforator(s) till the midpoint of this axis. After identification, an elliptical flap was marked based on the defect size. Posterior incision was given first and dissection was done till medial intermuscular septum of arm. Perforator was sought out over the preoperatively marked sites, and a single largest perforator with distinct artery and vein was selected. Flap was successfully harvested in a fasciocutaneous plane over a single perforator and rotated to cover the defect. Dressing and splintage was done post operatively. Figure 1 shows the diagrammatical depiction of the technique to raise the flap.

Figure1: *Diagrammatic depiction of surgical technique*

Results

15 consecutive patients with 9 males and 6 females were included in the study. The average age of patients was 8.5 ± 1.3 years. In 13 patients, soft tissue defects resulted after release of post burn elbow flexion contractures, while in 2 patient there was post traumatic soft tissue defect. table 1 shows the demographic and clinical details of the defect. In all cases, a consistent perforator was found within 3cm of the medial epicondyle. Figure 2 shows the distance at which dominant perforators were found from the medial epicondyle. The average distance was 2.62 ± 0.7cm as shown in figure 3. All the perforators arose from the superior ulnar collateral artery. In 14 patients the defect was anteriorly located over the cubital fossa and in 1 patient the defect was located posteriorly over the olecranon process. None of the flaps extended beyond the midpoint of the line between medial epicondyle and posterior axillary fold. All perforators have septocutaneous course Figure 4 shows a patient with high voltage electric injury resulting in elbow contracture. Release of contracture and coverage with medial arm flap was done. Figure 5 shows reconstruction of soft tissue defect after release of post burn contracture. There was complete flap survival in our case series and all the donor site defects were closed primarily.

Table 1: *patients demographic and defects details*

Characteristics		No. of patients	%
Gender	Male	9	60%
	Female	6	40%
Etiology	Post burn contracture	13	87%
	Post traumatic defec t	2	13%
Site	Anterior elbow	14	93%
	Posterior elbow	1	7%

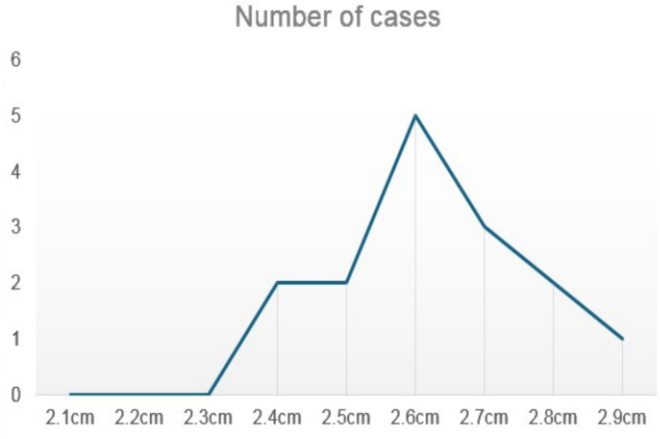

Figure 2: *Presence of dominant perforator at medial epicondyle in this cases series*

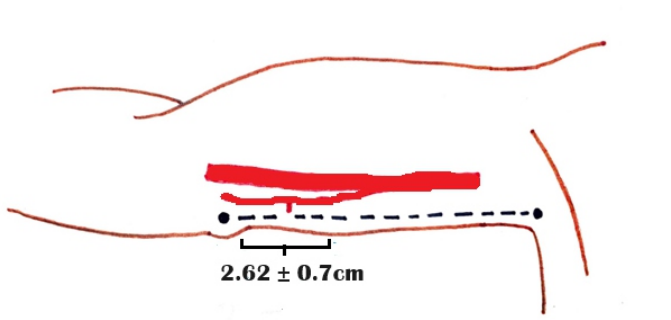

Figure 3: *Mean distance from the medial epicondyle at which the dominant perforator was located*

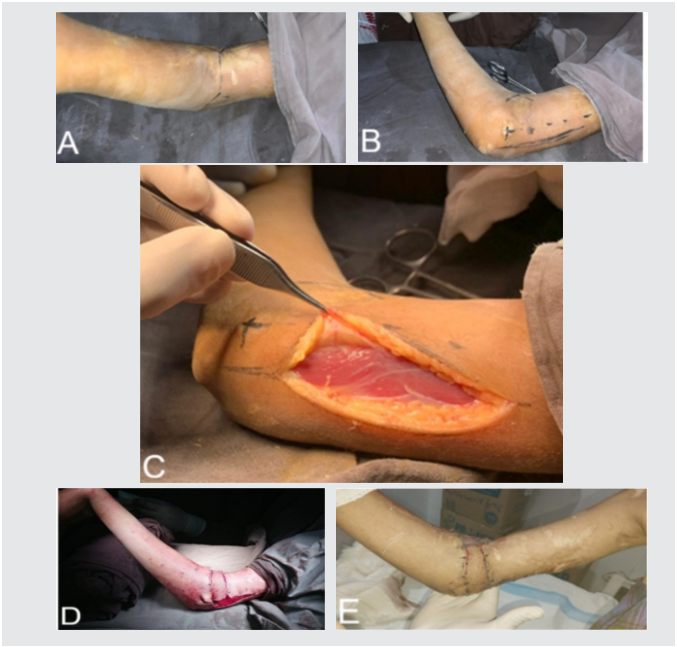

Figure 4: *Release of post electric burn elbow contracture and coverage with medial arm flap A. Preoperative marking of the perforator (B). Posterior incision and identification of the perforator (C). Coverage of the released surface with flap and split thickness skin graft (D). Complete flap survival on follow up after 1 week (E).*

Figure 5: *Release of post burn contracture and coverage with medial arm flap. Volar view after flap insetting (A). Dorsal view showing final flap insetting and STSG (B). Complete flap survival noted at 2 weeks of follow up (C).*

Discussion

Elbow defects are a unique reconstructive challenge, for which many strategies such as grafting, loco-regional, distant flaps and rarely free tissue transfer have been explored.[9] Grafts alone need prolong splintage and extensive physiotherapy to prevent recurrent contractures, which is difficult in pediatric age group.[10] On the contrary, free flaps require prolonge operative time and monitoring.[11] Localized fascio-cutaneous flaps, especially perforator-based flaps have been an area of interest for plastic surgeons owing to ease of dissection, reliable blood supply, good cosmetic result, and limited donor site morbidity.

Lateral Arm flap and Radial forearm flap have been described for elbow reconstruction but are limited due to obvious scar at lateral arm in cases of post burn contractures and sacrifice of a major vessel, respectively.[12] The medial arm flap, first described by Tagliacozzi, in 1597 has been utilized for resurfacing of head & neck, wrist and hand defects.[13] Cegarra-Escolano described the perforators of upper limb, the source vessels of which frequently accompanied the major nerves.[14] Coming out of the source vessels, the majority of perforators concentrated near the proximal and distal joints of a limb. Malzone G et al described the use of perforator-based propeller flaps for upper limb reconstruction, evading the need for mobilization of the source vessels.[15] Medial arm flap offers a convenient option for reconstruction of the defects around elbow and the skin is usually spared in majority of injuries at this region.

Cil Y et al describe a cadaveric study, describing a consistent perforator from brachial artery in distal forearm, suggesting flaps based on it to be a useful option for elbow reconstruction.[16] similarly, Gong et al performed a retrospective study on 8 patients for elbow reconstruction with perforator based medial arm flap, with complete survival of all flaps.[17] However they did study in adult patients and found a perforator in distal forearm arising from either brachial artery or superior ulnar collateral artery. Uslu et al presented a case report of medial elbow reconstruction with perforator based medial arm propeller flap, however, did not mention the precise location and origin of the perforator.[18] Medial arm flap provides thin, pliable, hairless skin which is in close proximity to elbow serving as a cosmetically superior reconstructive option for elbow defects. How-

ever, due to its anatomic variability, it had not become as popular.

Our study demonstrated a consistent perforator within 3cm of the medial epicondyle, and complete flap survival in all cases attesting to the reliability of the perforator. Although we were able to demonstrate the consistent presence of the perforator, but we only covered small to medium defects and didn't take tissue beyond the midpoint of arm, which necessitates further research to define safe limits of the flap. Similarly, the study was based on pediatric age group and in adults the perforator maybe located beyond the distance that we have found in our study.

Conclusion

Medial arm flap based on a consistent perforator near medial epicondyle, is a reliable reconstructive tool for coverage of elbow defects.

Ethical Approval

The Institutional Review Board (IRB), King Edward Medical University, Lahore approved this study vide letter #. 308/RC/KEMU dated 03-06-2022

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Author's Contribution:

Muhammad Omar Afzal: Data collection, Manuscript Revision, analysis and interpretation of data and final approval of the version.

Aroobah Iqbal: Conception and design of the study, data collection, analysis and interpretation, Drafting the work Final approval of the version to be published and accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Javeria Khan: Contribution to conception and design of study, Data Interpretation and Analysis and final approval of the version

Sadia Hussain: Data Collection, Data Analysis and final approval of the version

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Research Article

Outcome of Autologous Fat Grafting to Breast: A Simple Procedure for Complex Cases

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Abstract

Background: Autologous fat grafting to the breast is utilized both as a primary procedure and as an ancillary procedure in complex cases, including oncoplastic breast reconstruction, congenital anomalies, and for patients undergoing revision surgeries.

Objectives: The objective of the study is to compare the pre-operative and post-operative quality of life and satisfaction scores of patients using Breast Q undergoing fat grafting to the breast in such complex cases.

Methodology: This study was conducted at the Jinnah Burn and Reconstructive Surgery Centre in Lahore, spanning from June 2023 to July 2024. We used a pre-post study design. Fat grafting in breast was done in 33 eligible cases. We compared pre-operative and post-operative satisfaction scores of patients. Outcome measure was calculation of satisfaction score pre-operatively and post-operative at 3months, 6months and 9 months. Breast-Q questionnaire was completed prior to surgery and after surgery. Breast-Q was analyzed using Q-score software. Paired t test was used to compare pre and post Breast-Q score with $p < .05$ as statistical significant.

Results: The Breast-Q score software was employed to analyses both pre-operative and post-operative data. The findings revealed a substantial improvement in satisfaction scores across various parameters including breast appearance, psychosocial and sexual well-being. However, slight decline was observed in physical well-being scores following the operation.

Conclusion: Autologous fat grafting to the breast for complex cases proves to be a straightforward method with promising outcomes. Patients generally accept the technique well, with statistically significant improvements observed in both quality of life and satisfaction scores.

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Introduction

Breast reconstruction procedures are performed to address complex deformities, including defects resulting from tumour excision, congenital anomalies, prior surgical interventions, and sequelae of radiation therapy. The field offers a diverse array of options to meet the unique needs of each case. The options available are breast implants,[1,2] reconstruction with LD, TRAM an d DIEP flaps[3,4] autologous fat grafting[5,6] and recently developed BRAVA assisted fat grafting.[7] Even with the provision of the most optimal available options, patients often necessitate ancillary procedures and revision surgeries, both within the same breast and to attain symmetry in the contralateral breast. Our study highlights complex cases where autologous fat grafting served as the primary procedure for congenital anomalies, as well as ancillary procedures for previous reconstructions and cases of prior failed attempts.

While breast implants are frequently chosen for their aesthetic benefits and often yield promising results[1, 2]

they come with notable costs and risks of complications.[8] Deciding on their use as ancillary procedures or in revision surgeries can be challenging. Moreover, patients undergoing post-operative radiation therapy may face heightened risks of complications.[9] Although implants generally enjoy good acceptability among patients, their suitability warrants reconsideration in cases with complex etiologies, involving multiple prior procedures or upcoming radiation therapy.

Breast reconstruction with microvascular flaps has promising results in complex cases.[3,4,10] However, this approach demands microvascular surgery, resulting in extended surgical and hospitalization durations. Moreover, for patients with previous breast reconstruction who subsequently experience volume loss, asymmetry, or radiation-related sequelae, opting for additional flap surgery may not be ideal.

Autologous fat grafting to the breast involves transferring fat from areas such as the thighs and abdomen to address contour deformities. This straightforward day surgery method eliminates the need for microvascular skills, additional costs for patients already undergoing multiple procedures, and has demonstrated promising results[5,7,11]. Utilizing the patient's own fat offers a natural appearance, reduces the risk of rejection, and provides simultaneous contouring benefits.[12] Moreover, studies have shown that autologous fat grafting does not adversely affect patient outcomes in cases of breast cancer[13] or long-term follow-ups of breast reconstruction,[14] making it a simpler and viable option in such scenarios.

Another available option is BRAVA-assisted autologous fat grafting, which allows for the transfer of a larger volume of fat in a single session.[7] However, this method entails significant discomfort for the patient,[12] as it requires wearing a suction device for 10-12 hours daily over a period of several months.

The aim of this study was to evaluate the outcomes of autologous fat grafting to the breast in complex cases, focusing on quality of life and patient satisfaction both pre- and post-surgery. The results of this research will offer valuable insights into the feasibility and effectiveness of autologous fat grafting as an alternative technique for breast reconstruction, as well as its utility in ancillary procedures and revision surgeries. These findings have the potential to enhance the understanding of plastic surgeons, aiding them in making informed decisions when selecting the most appropriate approach for individual patients in complex cases.

Methodology

The study was conducted at Jinnah Burn & Reconstructive Surgery Centre, Lahore from June 2023 to July 2024. The inclusion criteria encompassed female patients aged 18 years and above requiring corrective procedures for various conditions, including congenital deformities, volume loss, asymmetry resulting from previous breast reconstruction, failed implants, correction of surgical defects, and complications from oncoplastic breast surgery such as radiation sequelae or other complex cases. To ensure the study focused on assessing the outcomes of autologous fat grafting specifically in complex cases, patients seeking breast augmentation solely for aesthetic reasons were excluded from participation. Additionally, individuals with uncontrolled co-morbidities that could potentially impact the prognosis of fat uptake were also excluded from the study. The study met all the research protocols, initial study draft was prepared, presented before Ethical Review Board and approval was obtained. Informed consent was obtained following Declaration of Helsinki. An approach was adopted that integrate informed consent and patient education in breast augmentation[15]. The patient underwent thorough counselling regarding autologous fat grafting, including discussions on prognosis, anticipated fat retention rates, the potential necessity of multiple sessions, and potential donor site impacts.

All 33patients who opted for fat grafting were assessed at the three, six and nine-month mark. Among them, 12 had undergone previous breast reconstruction after tumor surgery and experienced subsequent volume loss and radiation effects. 15 patients sought correction for congenital anomalies, three had experienced failed implant attempts, and one required correction for a surgical defect post-abscess drainage.

During autologous fat grafting procedures, surgeries were conducted under general anesthesia. However, in one case involving a surgical defect post-abscess drainage, local anesthesia was administered. Thighs were predominantly utilized as donor sites to ensure a stable fat source.. Fat harvesting was performed using Coleman cannulas and 10ml syringes, employing manual suction to prevent adipocyte damage. The fat preparation involved sedimentation, with only the pure fat layer used for injection. Injection was carried out using 2.5mm transfer cannulas and 10ml syringes, targeting two planes: the deep plane utilizing a reverse liposuction technique and the superficial plane employing a mapping technique. Care was taken to avoid overfilling during

fat transfer, with 150ml to 350ml injected into each breast depending on tissue acceptability. Adhering to the 140% rule, wherein 140ml was transferred for every desired 100ml outcome to counter fat resorption, was paramount. Incisions were closed with rapidly absorbing sutures, and patients were advised to wear customized compression garments for the first week post-operation.

Patients underwent follow-up appointments at 2 weeks, 3 months, 6 months and 9 months post-operation, with the next scheduled follow-up at the one-year mark. The assessment of outcomes was conducted through the utilization of quality of life and patient satisfaction scoring, employing a breast questionnaire. At the 3,6 and 9-month follow-up, patients responded to additional categories including Satisfaction with Outcome, Satisfaction with Information, Satisfaction with Plastic Surgeon, Satisfaction with Medical Team, and Satisfaction with Office Staff. The raw data collected from the Breast-Q questionnaire was analyzed using the Q-score version 1.0 (Augmentation module). There is no overall or total BREAST-Q© score. All BREAST-Q© scales were transformed into scores that range from 0-100. The scores are computed by adding the response items together and then converting the raw sum scale score to a score from 0-100. For all BREAST-Q© scales, a higher score means greater satisfaction or better QOL (depending on the scale).Breast-Q was analyzed using Q-score software. Statistical analysis was done using SPSS version 21. Paired t test was used to compare pre and post Breast-Q score with $p < .05$ as statistical significant.

Results

The Breast Q-score version 1.0, along with its user guide, pre-operative template, and post-operative template, was accessed from the provided link (https://qportfolio.org/ breast-q/breast-q-augmentation/) (Accessed on 12 December 2022). During the study period, a total of 44 patients met the inclusion criteria. Among them, 33 patients chose autologous fat grafting as their preferred treatment option. Six patients underwent 2nd session of fat graft as well.

The patients underwent follow-up appointments at 15 days, 3 months, 6 months and 9 months post-operatively. The assessment of outcomes in terms of quality of life and patient satisfaction was conducted, once edema had settled and final results were achieved. Due to two patients being lost to follow-up, data from 31 patients were analyzed. The responses were analyzed using Q-score version 1.0 (augmentation module), and statistical analysis was done using SPSS version 21 comparing pre-operative and post-operative responses (Table 1, 2, 3), and calculating post-operative satisfaction scores (Table 4).

Table 1: *Pre and Post-Op (3 months) quality of life BREAST-Q scores (n=31)*

Quality of life BREASTQ scores	Mean	Std. Deviation	P Value
Satisfaction with Breast Pre-Op	19.0968	11.63144	0.000
Satisfaction with Breast 3 months	60.8387	15.82845	
Psychosocial Well being Pre-Op	5.6129	7.77465	0.000
Psychosocial Well being 3 months	66.8387	19.83784	
Physical well-being Pre-Op	75.7097	12.86907	0.000
Physical Well being 3 months	41.5806	15.08150	
Sexual Well being Pre-Op	12.4839	9.67771	0.000
Sexual Well being 3 months	67.8065	23.32726	

Table 2: *Pre and Post-Op (6 months) quality of life BREAST-Q scores (n=31)*

Quality of life BREAST-Q scores	Mean	Std. Deviation	P Value
Satisfaction with Breast Pre-Op	19.0968	11.63144	0.000
Satisfaction with Breast 6 months	64.6129	18.93089	
Psychosocial Well being Pre-Op	5.6129	7.77465	0.000
Psychosocial Well being 6 months	69.7419	18.99994	
Physical well-being Pre-Op	75.7097	12.86907	0.000
Physical Well being 6 months	60.1290	16.21263	
Sexual Well being Pre-Op	12.4839	9.67771	0.000
Sexual Well being 6 months	74.0968	23.93373	

Table 3: *Pre and Post-Op (9 months) quality of life BREAST-Q scores (n=31)*

Quality of life BREAST-Q scores	Mean	Std. Deviation	P Value
Satisfaction with Breast Pre-Op	19.0968	11.63144	0.000
Satisfaction with Breast9 months	74.0000	21.15341	
Psychosocial Well being Pre-Op	5.6129	7.77465	0.000
Psychosocial Well being 9 months	72.0968	23.52212	
Physical well-being Pre-Op	75.7097	12.86907	0.006
Physical Well being 9 months	85.5484	15.99133	
Sexual Well being Pre-Op	12.4839	9.67771	0.000
Sexual Well being 9 months	76.3548	22.88893	

Following the intervention, significant improvements were observed in parameters related to satisfaction with breasts, sexual well-being, and psychosocial well-being. However, there was a notable decline in physical well-being, as evidenced by increased symptoms of pain, tightness, and limitations in daily activities. This decline may be attributed to the intervention itself and improved over time.

Table 4: *Post-Op Satisfaction Score (n=31)*

Domain	N	Mean	Std. Deviation
Satisfaction with Outcome 6 months	31	69.3548	25.38313
Satisfaction with information 6 months	31	68.3226	16.83723
Satisfaction with plastic surgeon 6 months	31	75.5161	21.50174
Satisfaction with medical team 6 months	31	81.4194	21.83693
Satisfaction with office staff 6 months	31	80.8065	25.46556

In our post-operative assessment, satisfaction rates were notably high. Given the complexity of cases, often involving patients with previous surgical interventions, it's understandable that the satisfaction with outcome scores were relatively lower. However, patients consistently expressed satisfaction with the surgeon, the medical team, and the overall staff. Representative images are given to show the Results of fat graft (Fig 1 – 5).

Fig 1: *Patient with asymmetrical breasts was offered with autologous fat graft on right side, and breast lift on left side. Pre & post-operative frontal view (a & b). Pre & post-operative lateral view (c & d).*

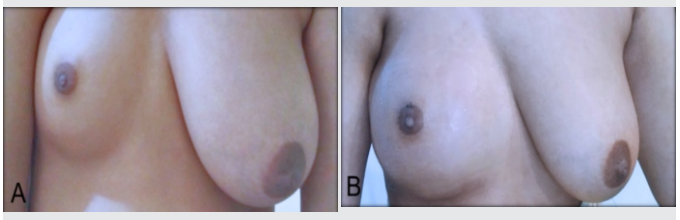

Fig 2: *Poland Syndrome. Pre-op images (a). Post-operative results after fat graft (b). Over grafting to achieve ideal results in complex cases can cause complications.*

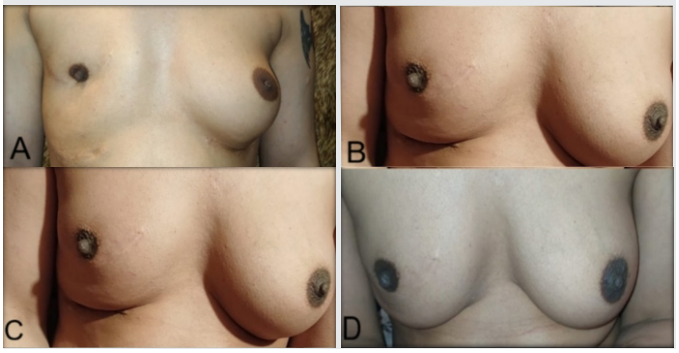

Fig 3: *Patient with previous failed implants was offered autologous fat grafting (a). Results after first session are shown (b). Results after second session (c).final results after followup (d).*

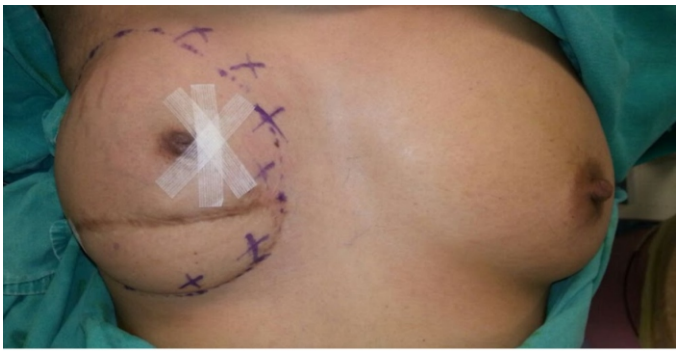

Fig 4: *Patient with previous DIEP flap reconstruction, immediate results after fat grafting are shown.*

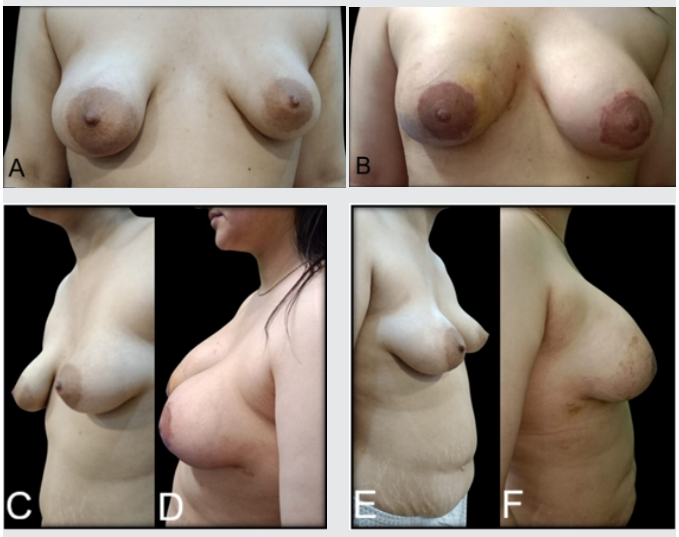

Fig 5: *Patient with tuberous breasts. Pre and post operative pictures are shown. Pre-operative frontal view (A), post-operative results at frontal view (b), pre & post-operative left lateral view (c & d), pre & post-operative right lateral view (e & f).*

Discussion

Autologous fat grafting for breast augmentation is a well-established practice, historically used to address

aesthetic, symmetry, and contour concerns.[16,-19] Its technique is thoroughly documented in existing literature.[11] Our aim in this study was to apply this technique to complex cases, particularly in patients who have undergone multiple surgeries and are dealing with radiation-related sequelae. We aimed to provide them with a minimally invasive procedure, leveraging its well-documented safety, efficacy[19] and outcomes, including acceptability, technique,[11] fat resorption rates,[20] application in breast cancer patients13 and donor site effects as well. Our study focused on treating patients with complex aetiologies using this minimally invasive fat grafting technique to the breast, and subsequently evaluating the outcomes based on quality of life and patient satisfaction scoring.

In other available options we had implants, microsurgical flaps and BRAVA assisted fat grafting. Among the available options, implants are commonly utilized for breast augmentation, offering aesthetically pleasing and widely accepted outcomes.[1,2] However, they come with drawbacks such as reported issues of capsular contracture, rippling, rupture, and the need for re-operations.[8,21,22] The usage of breast implants is not safe in patients that are undergoing radiation therapy.[9] Additionally, for individuals who have undergone multiple procedures, the added expense of implants can be a disadvantage. Nevertheless, implants can be combined with autologous fat grafting to optimize results.[20]

Breast reconstruction can also be achieved through techniques such as latissimus dorsi (LD) flap, deep inferior epigastric artery (DIEP) flap[10] and transverse rectus abdominus (TRAM) flap.[3,4] While these flaps offer promising results in breast reconstruction, their use for volume enhancement, correcting contour deformities, and addressing asymmetry in patients who have previously undergone reconstruction or radiation therapy is not always ideal. This is because they necessitate microsurgical procedures with prolonged hospital stays and significant morbidity. Furthermore, performing pedicled or microvascular flaps in tissues already irradiated presents additional challenges.

An alternative option involves pre-expansion using the BRAVA bra system followed by autologous fat grafting[7]. Pre-expansion typically begins several months prior to fat transfer. However, this approach was not widely favored by most patients due to the requirement of wearing the expansion device for 10-12 hours daily over a period of 2-3 months.

The procedure of autologous fat grafting demonstrated minimal morbidity across all aspects, could be performed as a day case surgery, was cost-effective, and readily accepted by our study population. Long-term follow-up studies in breast cancer patients have shown autologous fat grafting to be safe. While an additional layer of fat might affect physical examination, radiological investigations can effectively distinguish between tumor and normal tissue.[23] Similarly autologous fat grafting has no interference in long term follow up of reconstructive cases as well.[24] In cases of radiation sequelae, offering treatment with autologous fat grafts provides additional benefits over implants. Autologous fat promotes neovascularization,[25,26] contrasting with implants that can lead to tissue thinning, ulceration, and exposure. Additionally, in complex cases where implant insertion or microvascular flap anastomosis options are limited, autologous fat transfer presents a straightforward solution.[6]

We evaluated the patient reported outcomes based on quality of life and patient satisfaction using the widely accepted Breast-Q scoring system.[27] Patient reported outcome measures (PROM) are very essential to evaluate benefits of surgical techniques.[28] PROMs can be recorded in a paper format and in electronic formats, with some studies showing superiority of e-PROMs.[29] The method we chose is Breast-Q which is a multi scale, multi module patient reported instrument measuring health related quality of life and patient satisfaction in women who underwent breast surgery.[30] The limitation of study was that we did not assess patients based on the percentage of fat take, as our results were consistent with those already documented in the literature.[20] Moreover, the small sample size restricts the ability to identify statistically significant factors that could influence long-term outcomes for this specific group of patients. Comprehensive studies with larger sample sizes for a longer duration will be essential to thoroughly investigate this matter.

The findings of this study can guide plastic surgeons in considering autologous fat grafting as a more dependable and widely accepted option. This approach has the potential to alleviate the burden on patients and the healthcare system by reducing morbidity, improving cost efficiency, and minimizing hospital stays.

Conclusion

Assessed through the lens of Breast Q Scorer version 1.0, autologous fat grafting in the breast emerges as a substantial advancement in plastic surgery. Our findings

highlight its effectiveness in fostering heightened patient satisfaction and enhancing quality of life post-breast reconstruction, especially in complex cases. By furnishing evidence-based insights, this study aids patients and healthcare providers in making informed decisions, thereby promoting patient-centered care and optimizing outcomes in breast surgery.

Ethical Approval

The Institutional Review Board (IRB), Jinnah Burn & Reconstructive Surgery Centre, Lahore approved this study vide letter No. 6770/ED/JB&RSC dated 08-11-2022

Conflict of Interest: None

Source of Funding: None

Authors contribution

Bilal Umar: Data collection, Conception and design of the study, analysis and interpretation, Final approval of the version to be published and accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Ammara Rabbani: Drafting the work, Study design, Data Collection and analysis and interpretation

Barira Bashir: Conception and design of the study, critical revision of the article and final approval of the article to be published

Hafiz Khalil Ahmad: Data collection, Manuscript Revision, analysis and interpretation of data

Muhammad Tariq Iqbal: Article Editing, Manuscript Revision, analysis and interpretation of data

Kamran Khalid: Article Editing, Manuscript Revision analysis and interpretation of data

All authors meet the ICMJE authorship criteria and agree to be accountable for all aspects of the work, ensuring the accuracy and integrity of the research.

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Research Article

Improvement in Range of Motion after Surgical Correction of Post-Burn Axillary Contractures.

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Abstract

Background: Axillary contractures can be very detrimental to the entire upper extremity limiting the daily activities. Reconstructive surgical intervention is frequently used to avoid future abnormalities and restore functional joint motion.

Objective: The purpose of this study is to assess the effectiveness of surgical correction of post-burn axillary contractures in improving the range of motion at shoulder joint.

Methodology: This prospective study was conducted at Burns and Plastic Surgery Centre, Peshawar from January 2021 to December 2021. Patients of all ages and either gender having post-burn axillary contractures were included in the study. Patients with electric burns, acid burns, recurrent contractures, complex contractures involving other joints and patients with bilateral axillary contractures were excluded. Data was analyzed using SPSS version 27. Paired T-test was performed to compare the preoperative and postoperative shoulder abduction angles

Results: The study included 34 patients, with male preponderance. The mean age of the patients was 24.18 ± 11.13 years. Majority were flame-burns. Contractures were released and managed according to their degrees. There was 66.67% improvement in abduction angle in patients with type 1 contractures; 63.89% in type 2 contractures; and 50% in type 3 contractures. The overall difference in abduction angles was highly significant ($t=-68.42$, $p < 0.001$). Post-operative complications were noted in 05 patients.

Conclusions: The type of surgical treatment used to correct post-burn axillary contractures is determined by the pattern of scar contracture and the condition of the surrounding skin. Timely and effective release can significantly improve function by restoring near-normal range of motion at the shoulder joint.

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Introduction

Burn injuries are a serious public health concern in impoverished countries such as Pakistan, where they are the second most common cause of accidental fatality, after road traffic accidents. The total number of burn injuries per 100,000 people is 76.3 for emergency visits, 17.0 for admission to the hospital, and 0.3 for emergency fatalities.[1] This high incidence is ascribed to many factors such as impoverishment, inadequate awareness of burn prevention, lack of integrated epidemiological data, limited access to specialist units, and hence inefficient use of existing burn care facilities.[1,2]

Upper extremity burns account for a significant portion of these cases. Deep thermal burns to the upper extremities can frequently result in crippling post-burn contractures, particularly the ones affecting the axillae,

leading to serious impairment in function and limitations in shoulder extension.[2] Post burn axillary contracture may occur due to ineffective splintage during the acute burns phase or incorrect post-burn rehabilitation. To reduce axillary contractures, the initial management should include correct positioning of the shoulder joint in an abduction splint and vigorous physiotherapy. Surgical intervention remains challenging since the axilla is a distinct three-dimensional tent-like structure.[3,4] Despite adequate initial management, the incidence of post burn axillary contractures remains high. A review of patients treated over 25 years at Shriners Burns Hospital in Galveston, Texas, found a high prevalence of axillary deformities, (248 out of 1005).[5]

The fundamental issue with axillary contractures is inelasticity of one or both axillary folds, which restricts full extension and/or abduction of the shoulder joint. Additionally, there are two factors to consider when planning surgical correction: the extent of scarring of surrounding skin, and involvement of the axillary hair-bearing area. It is unusual for the hair-bearing area to be implicated in thermal injury due to it being shielded by the upper extremities being kept in adduction.[6,7] According to Kurtzman and Stern, axillary contractures are classified into three categories [Table 1][8].

Table 1: *Kurtzman and Stern classification of axillary contractures*

Classification	Description
Type 1A	Injuries involving anterior axillary fold only
Type 1B	Injuries involving posterior axillary fold only
Type 2	Injuries involving both anterior and posterior axillary folds but sparing axillary dome.
Type 3	Injuries involving both anterior and posterior axillary folds along with dome.

The aim of surgical correction of axillary contractures is to achieve maximum release while minimizing anatomical distortion. A number of techniques have been documented to treat axillary contractures including skin grafts, local flaps, Z-plasty, free flaps, and tissue expansion.[9,10] It is challenging because joint stiffness and high recurrence rates are relatively common. Most surgeons treat type I and type II axillary contractures using local advancement flaps such as Z-plasties, K-plasties, and V-Y plasties. Excision and skin grafting, muscle flaps or fasciocutaneous flaps may be utilized to treat type III axillary contractures.[11] Regardless of technique utilized, the goal is to improve abduction angle to near-normal values. The purpose of this study is to assess the effectiveness of surgical management for post-burn axillary contractures, with a focus on functional outcomes and sustained improvement in range of motion of the shoulder joint.

Methodology

This prospective study was conducted at Burns and Plastic Surgery Center, Hayatabad Peshawar from January 2021 to December 2021. After obtaining Ethical Committee's approval, all patients (of any age and gender) presenting with post thermal burn axillary contracture, present since at least 6 months, were included. Patients with contractures due to electric burn or chemical burn, recurrent contractures, complex contractures involving more than 1 joint, and bilateral contractures were excluded.

Angle of abduction at the shoulder was assessed and documented pre-operatively. After standard pre-operative preparation, all patients underwent surgery under General Anesthesia. The surgical procedures employed were single or multiple Z-plasties, release of contracture with either skin graft coverage, or local flap coverage. All patients received standard post-operative care as per their procedure. They remained on follow-up for at least 1 year, during which time they underwent physiotherapy. At 1 year, the angle of abduction was again assessed and documented.

Data was collected and analyzed using SPSS version 27. Quantitative variables were presented as means and percentages. A Paired t-test was performed to compare the preoperative and postoperative shoulder abduction angles among patients who underwent contracture release surgery.

Results

The study included 34 patients, with 19 (55.88%) males and 15 (44.11%) females. The mean age of the patients was 24.18 ± 11.13 years, with an age range of 08-48 years (Table 2).

Table 2: *Age-wise distribution of the patients*

Age-Wise Distribution		
Age bracket	**Number of patients**	**Percentage**
8-18	14	41.18 %
19-28	08	23.53 %
29-38	07	20.59 %
39-48	05	14.70 %
Total	**34**	**100 %**

Most burns were flame-burns 22 (64.71%), while scald burns were 12 (35.29%). In terms of hospital stay, 29 (85.29%) patients stayed for 2 days, 3 (8.82%) stayed for 3-5 days, and 2 (5.88%) stayed for more than 5 days.

With respect to surgical procedure performed, 21 (61.76%) patients had type 1 contractures and underwent Z-plasty alone, 9 (26.48%) patients had type 2 contractures and underwent local fasciocutaneous flaps and Z-Plasty, whereas for 04 (11.76%) patients with type 3 contractures, excision + STSG were done (Table 3 & 4).

Table 3: *Patient distribution according to type of axillary contracture*

Type of Axillary Contracture according to Kurtzman Stern Classification		
Type	**Number of patients**	**Percentage**
IA	11	32.35 %
IB	10	29.41 %
II	09	26.47 %
III	04	11.76 %
Total	**34**	**100 %**

Table 4: *Details of surgical procedure performed.*

Type of Procedure performed to release Axillary Contracture		
Procedure	**Number of patients**	**Percentage**
Z-Plasty	21	61.76%
Local Flaps + Z-Plasty	09	26.48%
Excision + STSG	04	11.76%
Total	**34**	**100%**

A significant improvement in post-operative range of motion in terms of shoulder abduction was observed in all patients. The mean pre-operative abduction angle in Group 1 (n=21) was 50.0 ± 1.41°, which improved significantly to 170 ± 1.41° post-operatively (66.67% improvement). Similarly, Group 2 (n=10) with a pre-operative angle of 45.0 ± 1.22° showed a significant improvement to 160.0 ± 0.87° (63.89% improvement), while Group 3 (n=04) had a preoperative mean of 30.0 ± 2.94° increasing to 120.0 ± 3.37° (50% improvement) after surgery. The overall difference in abduction angles was highly significant (t=-68.42, p < 0.001) (Table 5).

Table 5: *Mean Pre-operative and 1 year post-operative angles of abduction across various groups*

Post operative mean range of motion improvement				
Contracture type	**Number of Patients**	**Mean pre-operative Angle of Abduction**	**Mean post-perative Angle of Abduction**	**Mean Percentage Improvement**
Type 1	21	50	170	66.67%
Type 2	09	45	160	63.89%
Type 3	04	30	120	50%

Post-operative complications were noted in 05 patients; with tip necrosis in 03 (8.82%) patients and partial graft loss in 02 (5.88%) patients. Some representative cases are shown in figures 1-3.

Figure 1: *Type 1A axillary contracture (a, b, c: pre-operative views; d, e, f: post operative views)*

Figure 2: *Type 1B axillary contracture (a, b, c: pre-operative views; d, e, f: post operative views)*

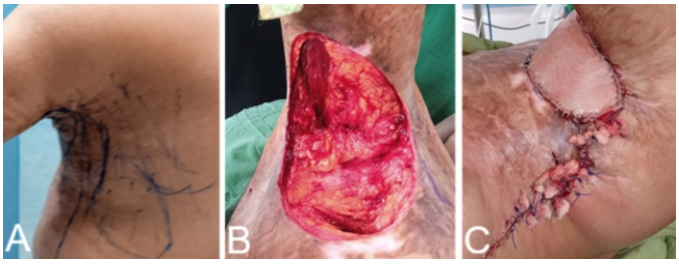

Figure 3: *grade-III axillary contracture A pre-operative view, B after contracture release, C after coverage with loco regional flap.*

Discussion

Post-burn axillary contractures are a common and challenging complication, particularly for individuals in

underdeveloped countries like Pakistan. Iqbal et al1 emphasizes the alarming incidence of burn-related injuries in Pakistan, highlighting that Pakistan lacks adequate burn care facilities, which exacerbates the incidence of contractures due to delayed treatment and improper rehabilitation.

Our study aimed to evaluate the efficacy of surgical intervention in improving range of motion at the shoulder joint; and showed that early intervention and proper surgical release can significantly improve the outcomes in these patients. There have been numerous reports of the effectiveness of various surgical techniques for treating axillary post-burn structures, including skin grafting, local flaps, Z-plasties, free flaps, and island flaps. Kurtzman and Stern have suggested a system of axillary-contracture classification for therapy selection; nonetheless, the goal should be to resurface the axillary region with well-vascularized, flexible, and non-contracting tissue.[9,12,13]

The classification of axillary contractures, as proposed by Kurtzman and Stern (1990), is widely adopted in burn care to guide surgical planning. In our study, the most common type of contracture was Type IA (anterior axillary fold), which aligns with the findings of Güven et al[11] who also noted a higher incidence of anterior axillary fold contractures in their series of post-burn upper extremity contractures.

The main treatment modalities in our study were Z-plasty, skin grafting, and local flaps, where Z-plasty was performed on 61.76% of patients with Type I contractures. This is similar to the approach discussed by Karki et al. (2014), who suggest that Z-plasty is an effective method for treating linear scar contractures, particularly when the surrounding skin is healthy (Karki, Mehta & Narayan, 2014).[2] Our results demonstrate favorable outcomes in terms of improved range of motion, with a mean postoperative abduction angle of 160°, reflecting the success of Z-plasty in most cases.

Kumaran et al. (2008) conducted a study on post-burn axillary contractures, emphasizing the challenge of achieving full functional recovery due to joint stiffness (Kumaran et al., 2008).[3] Though not formally studied, we also noted that joint stiffness and limited range of motion remain significant concerns, even after successful surgical interventions. However, unlike Kumaran et al., who reported a higher recurrence rate for severe cases, our study found relatively fewer cases of recurrence, potentially due to the timely combination of surgery and post-operative physiotherapy.

The complications observed in our study, tip necrosis (8.82%) and partial graft loss (5.88%), are consistent with findings from Agbenorku,[6] who reported similar complications in the treatment of post-burn axillary contracture. This highlights that while surgical techniques like Z-plasty and local flaps provide functional benefits, they are not without risks, particularly in cases with poor skin quality or inadequate postoperative care. Similarly, Ndiaye et al[9] discuss complications such as flap necrosis and poor graft take in their study of axillary burn contractures.

Quong and Ogawa14 recently introduced a novel method of releasing axillary contractures using the two-facing square flaps technique, which has shown promising results in reducing scarring and improving shoulder mobility. While our study did not use this specific technique, the potential advantages of such flap-based methods, as compared to skin grafting, highlight the future direction of axillary contracture treatment, particularly for more severe cases.

Conclusion

The treatment of post-burn axillary contractures remains a complex and challenging issue in burn care. Early and appropriate surgical intervention, combined with comprehensive post-operative physiotherapy, leads to significant improvements in shoulder mobility and quality of life. Further research, particularly exploring novel surgical techniques such as the two-facing square flap, could offer even more effective solutions for complex cases.

Ethical Approval

The Institutional Review Board (IRB), Burns and plastic surgery centre, Phase-IV Hayatabad, Peshawar, approved this study vide letter No. 076 dated 26-02-2025

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Author's Contribution

Syed Muhammad Haider: Contribution to conception and design of study, Data Interpretation and Analysis and final approval of the version

Adil Rehman: Substantial contribution to acquisition of data, concept and design and final approval of the version to be published.

Muhammad Shadman: Conception and design of the study, data analysis and interpretation, Critical revision of

the article, Drafting the work Final approval of the version to be published and accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Fahimullah Khan: Contribution to conception and design of study, Data Interpretation and Analysis and final approval of the version

Qazi Amjad: Data analysis, Critical revision of the article, conception and design of the study and final approval of the study

Danish Akhtar Khattak: Interpretation of data Critical, revision of the article and final approval of the study.

All authors meet the ICMJE authorship criteria and agree to be accountable for all aspects of the work, ensuring the accuracy and integrity of the research.

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Research Article

Outcomes of Loco-Regional Perforator Flaps in Upper Limb Soft Tissue Defect Management

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Abstract

Background: The reconstruction of soft tissue defects in the upper limb is a complex yet frequent challenge. Local flap solutions have proven dependable and standard for addressing significant soft-tissue abnormalities in the proximal and distal upper limb.

Objective: To determine the outcome of loco-regional perforator flaps in terms of post-operative flap survival in soft tissue defects of upper limb.

Methodology: This descriptive case study was carried out over a period of twelve months (January 2020 to December 2020) at the department of Plastic and reconstructive surgery, Dow University of Health Sciences, Civil Hospital, Karachi. Patients of both genders between 18-60 years of age, presenting with upper extremity defects of up to 8 cm length and 4 cm width, with exposed underlying structures thus requiring soft tissue reconstruction, were included. Pedicled, locoregional perforator flap reconstruction was done in all cases. Patients were observed for complications daily until the 7th post-operative day.

Results: 30 patients were included in this study. Mean age was 36.43 years. A male preponderance was observed [21(70%) males and 9(30%) females]. Types of flap shows that radial artery flaps were done in 7 (23.30%), ulnar artery flaps in 11 (36.70%), posterior interosseous artery flaps in 4 (13.30%), lateral arm flaps in 6 (20%) and medial arm flaps in 2 (6.70%) patients. Flap survival was found in 27 (90%) patients.

Conclusion: Perforator flaps are an important tool in small to medium soft tissue defects requiring flap coverage.

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Introduction

Reconstruction of soft tissue defects in the upper limb is an intricate challenge due to its complex tissue anatomy and the dual need to restore both form and function.[1] Upper limb soft tissue trauma due to road traffic accidents may expose vital structures i.e nerves, tendons, joints or bones.[2] Other causes resulting in such defects are oncological resections, burn injuries, contracture releases, and soft tissue infections.

These complex defects are not suitable for merely skin grafting, and must be reconstructed with soft pliable tissue. Options for reconstruction include pedicled loco-regional flaps, pedicled distant flaps (such as abdominal and groin flaps) and free tissue transfer. All these modalities have their own merits and demerits.[3]

Perforator flaps, introduced in late 20th century have revolutionized upper limb tissue resurfacing by allowing defect reconstruction with flexible flap design and

minimal donor site morbidity.[4] A perforator flap is a faciocutaneous or adipocutaneous flap that is vascularized by a perforating vessel which arises from a deeper source axial artery. These vessels travel through or between muscles to supply the overlying subcutaneous tissue and skin.[3,5]

Utilization of perforator based flaps is a big paradigm shift in upper limb soft tissue defect management.[6] The pedicled perforator flaps harvest skin and subcutaneous tissue and conserve underlying muscle, resulting in functional preservation, decreased donor site morbidity and better cosmetic appearance. Also, perforator flaps often do not compromise the main vascular supply. Other benefits are reliable vascular source, improved contour, versatility in designing, short operative time and single stage reconstruction. Despite many advantages, outcome of perforator flaps depends on operative planning, defect size and location. Another very important point to consider is patient comorbid factors. A careful selection of patients and choice of flap will ensure overall better outcomes.

This study aims to evaluate clinical outcomes of perforator flaps in upper limb reconstruction in terms of flap survival and patient satisfaction. It also correlates outcomes with patient comorbid factors, i.e diabetes mellitus size of defect, and choice of flap. This will aid in improving outcomes and decreasing morbidity, as well as in clinical decision making.

Methodology

This was a descriptive study carried out at the department of Plastic and Reconstructive Surgery, Dow University of Health Sciences & Civil Hospital, Karachi over a duration of 12 months w.e.f January 2020 to December 2020. After obtaining IRB approval, a non-probability consecutive sampling was used. All patients of either gender, aged between 18-60 years, presenting to the plastic surgery clinic, or referred from other departments, with upper limb soft tissue defects of upto 8 cm in length and 4 cm in width, requiring flap reconstruction due to underlying exposed structures, were included in the study. Patients with concomitant fractures, segmental bone defects or osteomyelitis were excluded.

Patients with defect size more than 8 cm, and previous surgical scars around the soft tissue defects were also excluded.

After taking informed written consent, a detailed history and examination was carried out and data recorded on a proforma. After standard pre-operative preparation, perforator flap based reconstruction was performed in each case. Standard post-operative care was given to all the patients. Flap parameters were assessed on daily basis until the 7th post-operative day, at which time the patients were discharged unless otherwise indicated. All peri and post-operative data was also recorded on the same proforma.

The data were entered and analyzed with SPSS-22 software. The mean and standard deviation were computed for quantitative characteristics such as age, wound size, and duration of surgery. Frequencies and percentages were computed for qualitative characteristics such as gender, flap type, diabetes mellitus, and flap survival. Relationship between flap survival and factors such as choice of flap, defect size, and diabetes mellitus was assessed using chi-square test. A P-value of $p \leq 0.05$ was considered significant.

Results

There were 30 patients included in this study. Mean age of the patients was 36.43±15.81 years, with a minimum age of 19 and a maximum age of 56 years. There was a male preponderance in this study population, with there being 21(70%) males as compared to 9 (30%) females. Table 1 further elaborates on the demographic and clinical details of the patients population.

Table 1: *Demographic and clinical characteristics of the patients*

Variable	Frequency (n)	Percentage (%)
Age		
≤35years	19	63.3
>35 years	11	36.7
Gender		
Male	21	70.0
Female	9	30.0
Diabetes mellitus		
Present	8	26.7
absent	22	73.3
Defect size		
<6 cm	16	53.3
>6 cm	14	46.7

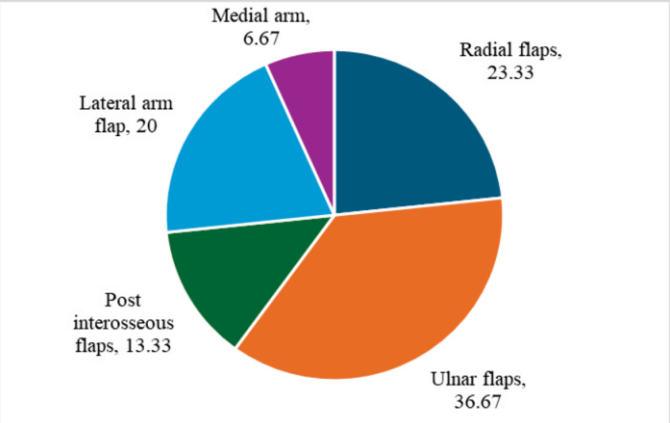

Figure 1: *Types of perforator flaps*

Various perforator flaps were used for soft tissue reconstruction in this study. The most frequently used were ulnar based perforator flaps (n=11, 36.67%), followed by radial artery based perforator flaps (n=7, 23.33%). Figure 1 represents the frequencies of types of perforator flaps used.

Complications were encountered in 3 (10%) of the patients and they all were diabetics.. One patient had complete flap loss, that was debrided and eventually resurfaced with pedicled groin flap. One patient had partial flap necrosis necessitating debridement and repeated dressings until granulation tissue was achieved and the wound was skin-grafted. The third patient had delayed wound healing due to wound infection which was managed conservatively with local wound care and culture specific antibiotics.

Table 2 represents the association between various variables (diabetic status, defect size, and type of flap) and the outcome of the flap procedure. Out of 8 diabetic patients in this study, 3(37.5%) had flap loss/ complications. According to the chi-square value (9.17, p = .01), diabetes is significantly linked to an increased risk of flap loss or complications.

It was observed that defect size was also associated with the outcome of the flap procedure (chi- square = 3.81, p = .05). All 16 patients with flap size less than 6 cm had complete flap survival. Conversely, among the 14 patients with flap size above 6 cm, 3 (21.4%) had flap loss or complication. This outcome is marginally statistically significant, suggesting that bigger defect sizes (>6 cm) may elevate the chance of complications.

The chi-square value (9.63, p = 0.05) showed a there was also a statistically significant relationship seen between flap type and outcome; the posterior interosseus flaps had the highest complication rate (50%).

Figure 2: *defect on extensor surface with exposed ulna, (b) flap elevated on perforator from ulnar artery, (c) 7th post-operative day*

The results show that flap outcomes are influenced by flap type, diabetes, and defect size. Patients with diabetes and those with bigger defects (>6 cm) are more likely to have problems. Flaps that demonstrated 100% survival were radial and ulnar perforator flaps, and medial arm flaps. Posterior interosseous artery perforator flaps had the highest incidence of complications. A few representative patients are shown in Figures 2-4.

Figure 3: *(a) post-burn contracture left elbow, (b) ulnar perforator based flap used to cover elbow region, remaining wound and donor site skin-grafted, (c) 2 weeks post-op*

Figure 4: *(a) post-electric burn defect of 1st webspace, (b) PIA flap raised, (c) PIA flap inset into defect*

Discussion

The upper limb has intricate anatomy and delicate functions. Defects of the upper limb requiring reconstructions are a fairly common occurrence in the field of plastic surgery. These result from high-energy trauma, tumor resections, burns, infections or congenital abnormalities. In a lower- income country like Pakistan, lack of safe

Table 2: *Relationship between patients' diabetic history, defect size and type of flaps with the outcomes of flap procedure (*p≤0.05 was considered significant).*

Variables	Categories	The outcome of Flap Procedures		Total	Chi-square value
		Flap-loss/ complication	Complete survival flap		
Proportion of non-diabetic and diabetic patients	Non-diabetic	0	22	22	9.17 P = .01*
		0.0%	100.0%	100.0%	
	Diabetic	3	5	8	
		37.5%	62.5%	100.0%	
	Total	3	27	30	
		10.0%	90.0%	100.0%	
Defect size	<6 cm	0	16	16	3.81 P = .05*
		0.0%	100.0%	100.0%	
	>6 cm	3	11	14	
		21.4%	78.6%	100.0%	
	Total	3	27	30	
		10.0%	90.0%	100.0%	
Type of flaps	Radial artery perforator flap	0	7	7	9.63 P = .05*
		0.0%	100.0%	100.0%	
	Ulnar artery perforator flap	0	11	11	
		0.0%	100.0%	100.0%	
	Post interosseous artery perforator flap	2	2	4	
		50.0%	50.0%	100.0%	
	Lateral arm perforator flap	1	5	6	
		16.7%	83.3%	100.0%	
	Medial arm perforator flap	0	2	2	
		0.0%	100.0%	100.0%	
	Total	3	27	30	
		10.0%	90.0%	100.0%	

work-place practices add to this burden. Traumatic injuries from traffic accidents and industrial events are the most common causes of soft tissue defects, frequently leading to exposure of neurovascular bundles, tendons, joints and bones that require timely and effective coverage.[8]

Perforator-based flaps have become increasingly favored in upper limb reconstruction because they allow for the transfer of well-vascularized skin and subcutaneous tissue while preserving the underlying muscle,[6] thus maintaining donor site function.

The selection of an appropriate perforator flap depends on several factors, including the defect's size, location, and depth, as well as the availability and reliability of perforators that commonly arise from radial, ulnar, posterior interosseous, and brachial artery. Furthermore these flaps can be thinned to better match the desired contour making it highly suitable for complex defects in upper limb.[10]

In our series of 30 patients, we utilized various flap types. Agarwal et al.[11] reported complete flap survival in 34 paraumbilical perforator flaps used for upper limb defects, with only two instances of minor distal necrosis resolving conservatively. In contrast, Teo et al. reported a 12.7% failure rate in a cohort of 63 freestyle propeller flaps, with most failures occurring early in their experience, suggesting a significant learning curve.[12]

All three flap complications that were seen in this study occurred in diabetic patients. These findings coincide with existing literature that suggests that diabetes notably affects vascular health and impairs wound healing. Diabetic patients may have microvascular dysfunction that results in reduced tissue perfusion, delayed angiogenesis, and impaired response to ischemia.[13,14] Similar findings were seen by Smith et al[15] who suggested that diabetics undergoing free or pedicled perforator based flap reconstruction had higher flap failure rates. Likewise, Lee noted a 20% higher rate of complications involving primarily skin flap necrosis and delayed wound healing in diabetics.[16]

In our study, all complications occurred in patients with defects > 6cm, highlighting that the size of the

defect may indeed be a limiting factor when considering perforator-based flap reconstructions in the upper limb. The is due to the increased metabolic demand placed on the small perforator. Moreover, insetting of large flap onto a concave arm/forearm may increase the likelihood of kinking of the vascular pedicle. This has been demonstrated by Huang et al and Zhao et al,[9] that larger defects are at higher risk of complications and flap loss.[9,17]

Radial[18] and ulnar artery perforators are found proximal to the wrist; the lateral and medial arm flaps are based on perforators of the posterior radial collateral and brachial artery, respectively,[19] and the PIA flap is based on a perforator in the midforearm on extensor surface. Although these perforators are anatomically consistent, the use of a hand-held doppler is an important tool in planning, especially for propellar and islanded design flaps.

The complications seen in our study may reflect technical factors such as kinking due to inadequate perforator dissection, greater arc of rotation, vessel strain particularly in the context of larger defects, and impaired microvascular circulation seen in diabetic patients. These observations are supported by existing literature highlighting diabetes mellitus as a key risk factor for impaired healing and flap failure due to microvascular dysfunction and delayed neovascularization.[13] Despite these complications, almost all flaps healed uneventfully, and patients experienced good functional and aesthetic outcomes, particularly when rehabilitation was initiated early. The color and texture match from local perforator flaps was satisfactory, and donor site morbidity was minimal, especially in cases where primary closure was possible.

Limitations of our study include a small sample size and a relatively short follow-up period, which may restrict long-term evaluation of functional recovery and sensory integration. A steep learning curve and the need for specialized training are important considerations. Furthermore, other comorbid factors such as smoking, COPD, hypertension, and immunosuppression should also be considered.

Conclusion

Perforator-based flaps are a reliable and versatile reconstructive option in upper limb defects, provided that due consideration is given to planning of flap design and the health and comorbid status of the patient, so as to improve the outcomes.

Ethical Approval:

The Institutional Review Board (IRB), Bolan medical complex hospital, Quetta, approved this study vide letter No. IRB-1086/BMCH/Approval/2020/401 dated 01-01-2020.

Conflict of interest: None

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Author's contribution

Masroor Ahmad: Conception and design of the study, analysis & interpretation of data , drafting of article, critical revision and Final approval of the version to be published and accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Irfan Ishaq: Acquisition of data, Data Collection and analysis and interpretation

Asadullah Awan: Study design, Data collection and Manu-script Revision

Romaisa Shamim Khan: critical revision of the article, manuscript revision and final approval of the article to be published

Abdul Waheed: Acquisition of data , Manuscript Revision, analysis and interpretation of data

Afzal Bashir: Article Editing, Manuscript Revision analysis and interpretation of data

All authors meet the ICMJE authorship criteria and agree to be accountable for all aspects of the work, ensuring the accuracy and integrity of the research.

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Case Report

Atypical Raoultella Ornithinolytica Infection Following Cosmetic Breast Reduction Surgery Abroad - A Case Report

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Abstract

Background: Raoultella ornithinolytica is a rare encapsulated gram-negative facultative anaerobe bacterium belonging to Enterobacteriaceae family. Raoultella orthinolytica is a rare cause of infections in humans. It is an under-reported, virulent pathogen found in community and hospital acquired infections following invasive procedures. Infections attributable to Raoultella ornithinolytica are relatively serious presenting as bacteraemia, sepsis, pneumonia, joint infections, biliary infections and peritonitis. However, it has not been identified as the sole pathogen in infected wounds following clean procedures like breast reduction surgery. A case of polymicrobial involvement with Raoultella ornithinolytica after breast reduction has been reported in one study [(1)].

We report a case of wound infection after breast reduction surgery solely caused by Raoultella ornithinolytica. The aim of the study is to make surgeons cautious of virulent wound infections with otherwise uncommon micro-organisms in patients who have had surgeries abroad.

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Introduction

Raoultella ornithinolytica was first described in 1989 by Sakazaki et al.[1] Initially classified as a Klebsiella species, it is now considered a separate species because of ribosomal variations and gene sequencing. It is a rare encapsulated gram-negative organism that is both commensal and free living in the environment. As a group, they have been described in several aquatic and non-aquatic environments including hospital settings. The organism is universally found in natural environments and it is not expected to have any geographical focal point. Nevertheless, we suspect that most likely our patient got infected with R. ornithinolytica during the operation in Turkey or potentially postoperatively as a travel-related infection because of exposure to a cosmopolitan community at airports and recycled air within the aircraft in a relatively immunocompromised post-surgery state.

There have been several suggested risk factors associated with Raoultella infections. Notable among these are previous long-term antibiotic therapy, uncontrolled diabetes mellitus, immunosuppression, intensive care unit stay and indwelling catheters. As it is an encapsulated organism, patients with hyposplenism are particularly susceptible to this infection. Our patient had no co-morbidities.

Interestingly, our patient had only signs of localized left breast wound infection and malaise. Her blood tests, especially inflammatory markers, were normal. Other sources of infection or bacteria were not identified. Normal blood results in such patients may not provide clinicians with a false complacence. Therefore, patients should be treated with antibiotics and close observation with vigilance should be undertaken, keeping in view the unique manifestations of atypical bacteria acquired in diverse foreign territories, that if left untreated could lead to adverse outcomes.

Ayoade et al. has reported fat necrosis and wound

infection after breast reduction with R. ornithinolytica, Escherichia coli and Enterococcus faecalis.[2] Tissue destruction and fat necrosis, attributed to Raoultella ornithinolytica in the study was treated with surgical debridement. However, no tissue destruction or fat necrosis was seen in our case and the infection settled with antibiotics. Likely R. ornithinolytica on its own does not cause fat necrosis. We surmise that fat necrosis might have been caused by E. coli or Enterococcus faecalis alone or in combination. Seng et al. reported that among all of 112 cases of R. ornithinolytica infection, only 13% were found with wound and skin infections. The rest were respiratory, biliary and gastrointestinal infections.[3,4,5]

Additionally, almost half were hospital acquired infections related to invasive procedures.[2] Antimicrobial treatment might be challenging due to resistance to different antibiotics. Raoultella ornithinolytica expresses beta-lactamase, which provides resistance to commonly use aminopenicillins.[1,3,4] The presence of a chromosomal bla gene is quintessential to its beta-lactamase resistance.[2] Furthermore, it usually remains undetected in basic bloodlines making it even more challenging and menacing.

Case Presentation

A 34-year-old female patient, presented to the Plastic Surgery department with an infected wound on the left breast with purulent discharge and generalized symptoms of lethargy, nausea and vomiting, loss of appetite, and headache. She underwent a bilateral breast reduction operation in a private hospital in Turkey, she recovered in the hospital and travelled back to the United Kingdom on the 7th post-operative day. Her initial postoperative period was uneventful, but on day 10 she noticed wound breakdown in her left breast with increasing pain and purulent discharge. The wound was swabbed in community and she was treated with Flucloxacillin 1 gram four times a day for three days.

Microbiology report revealed a profuse growth of Raoultella ornithinolytica resistant to amoxicillin, co-amoxiclav and cefuroxime, but sensitive to co-trimoxazole and gentamicin. Due to generalized symptoms and malaise, she was admitted to the hospital. At that time, she was otherwise fit and with no co-morbidites. The patient had mild tachycardia (95 beats per minute) at the time of admission and had a borderline pyrexia of 37.6 degree celsius. Vital signs, inflammatory markers, Carbapenemese-producing enterobacteriaceae (CPE) swabs, culture, CXR and USG of breast were normal. Intravenous co-trimoxazole 960mg twice a day was started as per microbiology advice followed by oral antibiotics after 48 hours. After a hospital stay of 3 days, her left breast wound infection was fully resolved and the patient was discharged. Unfortunately, no follow-up was possible in the NHS due to trust policies.

Discussion

The purpose of this case report is to highlight the fact that even clean surgeries are riddled with the threat of indigenous micro-organisms, non-native to the UK prevailing. International travel in the early postoperative period exposes the newly operated patient to rare, mutant micro-organisms. These have the potential to cause virulent, life threatening infections in even clean and straightforward surgeries. Surgeons in the UK should be cognizant of benign, atypical bacteria causing life threatening sepsis in patients who have had their surgery abroad. 75% of the patients were from a specific country. The importance of culture reports in these cases cannot be underscored enough. While Raoultella ornithinolytica infections are uncommon, their clinical implications are significant, especially in immunocompromised or critically ill patients.[5,6] The emergence of antimicrobial resistance and diagnostic challenges necessitates a vigilant approach to management, including rapid identification, susceptibility testing, and targeted therapy[(6)].

Raoultella ornithinolytica is sensitive to a variety of second to fourth generation cephalosporins. Immediate broad-spectrum antibiotic treatment should be established before accurate microbiological results are obtained.[5,6] When multi-drug resistance is encountered, combination therapies may be warranted. An emergence of carbapenemase-positive Raoultella ornithinolytica has been reported.[6] Our patient did not manifest the presence of Carbapenemase-producing enterobacterales (CPE).

Our patient did not require any surgical intervention as her left breast wound infection improved with conservative management with antibiotics and there were no signs of collection or fat necrosis. In our Plastic surgery department, we have noticed an increasing number of patients seeking medical help after undergoing cosmetic surgery abroad due to wound infection/dehiscence, retained stitches, haematoma, wound abscesses and infected implants. However, an infection caused by Raoultella ornithinolytica, that usually does not infect skin and soft tissues was a rarity.[7] Therefore we wished

to report such incidence.

We advise that patients wishing to travel abroad for plastic surgery should inform their GPs of their intentions, so to be warned of the risks associated with medical tourism. NHS policies in the case of wound infections and surgical failure should be explained in detail. Also, patients should be advised to try to travel as late as possible after surgery to ensure adequate follow-up by the operating surgeon and to avoid contamination and cross-infection in the cosmopolitan ambience of airports when they are in a relatively vulnerable state.

Conclusion

This case demonstrates the significance of expecting and recognizing infections with atypical highly-resistant organisms in otherwise clean surgeries performed abroad including the potential of travel-related exposure to a multitude of mutant microrganisms with mercurial presentations.

Conflict of interest: None

Source of funding: None

Author's Contribution

Fatima Khan: Interpretation and data analysis, data analysis and interpretation, Critical revision of the article, agreement to be accountable for all aspects of the work and final approval of the version to be published

Muhammad Adil Abbas Khan: Contribution to conception and design of study, Data Interpretation and Analysis and final approval of the version

All authors meet the ICMJE authorship criteria and agree to be accountable for all aspects of the work, ensuring the accuracy and integrity of the research.

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INSTRUCTIONS TO THE AUTHORS AND REVIEWERS OF THE MANUSCRIPTS

(Base upon Minimum Requirements for Writing and Editing of Manuscripts)

Introduction

The new Editorial Board of Pakistan Journal of Plastic Surgery during its meeting held on January, 2019 decided to follow the "Uniform requirements for manuscripts submitted to Biomedical Journals: writing & Editing for Biomedical Publications by International Committee of Medical Journal Editors. A brief account of minimum requirements is given below for assisting the authors, reviewers and editors, the full text can be read, (www.icmje.org). Moreover plagiarism policy of ICMJE, Higher Education Commission and PMDC will be observed. It is authors' responsibility to apprise them of plagiarism in any form including paraphrasing and self plagiarism. The Plagiarism Standing Committee of Pakistan Journal of Plastic surgery would deal with cases of plagiarism and comprise of staff members, and editors. Those claiming intellectual/ idea or data theft of an article must provide documentary proof in their claim otherwise their case will be sent for disciplinary action.

General Principles

1. Title Page

The title page should carry the following information:

1. The title of the article. Concise titles are easier to read than long, convoluted ones. Authors should include all information in the title that will make electronic retrieval of the article both sensitive and specific.
2. Authors' names and Title of the Program. The names and other relevant information should be on title page only to ensure blind peer review of research article.
3. The name of the department(s) and institution(s) to which the work should be attributed.
4. Disclaimers, if any.
5. Corresponding authors. The name, mailing address, telephone and fax numbers, and e-mail address of the author responsible for correspondence about the manuscript.
6. Source(s) of support in the form of grants, equipment, drugs, or all of these.
7. Word counts. A word count for the text only (excluding abstract, acknowledgments, figure legends, and references). A separate word count for the Abstract is also useful for the same reason.
8. The number of figures and tables.
9. Conflict of Interest Notification Page

2. Conflict of Interest Notification Page

To prevent the information on potential conflict of interest for authors from being overlooked or misplaced, it is necessary for that information to be part of the manuscript. It should therefore also be included on a separate page or pages immediately following the title page.

3. Abstract and Key Words

An abstract (requirements for length and structured format vary by journal) should follow the title page. The abstract should provide the context or background for the study and should state the study's purposes, basic procedures (selection of study subjects or laboratory animals, observational and analytical methods), main findings (giving specific effect sizes and their statistical significance, if possible), and principal conclusions. It should emphasize new and important aspects of the study or observations.

Authors are requested to provide, and identify as such, 3 to 10 key words or short phrases that capture the main topics of the article. These will assist indexers in cross-indexing the article and may be published with the abstract. Terms from the Medical Subject Headings (MeSH) list of Index Medicus should be used.

4. Introduction

Provide a context or background for the study (i.e., the nature of the problem and its significance). State the specific purpose or research objective of, or hypothesis tested by, the study or observation; the research objective is often more sharply focused when stated as a question. Both the main and secondary objectives should be made clear, and any pre-specified subgroup analyses should be described. Give only strictly pertinent references and do not include data or conclusions from the work being reported.

5. Material and Methods

The Methods section should include only information that was available at the time the plan or protocol for the study was written; all information obtained during the conduct of the study belongs in the Results section.

(a) Selection and Description of Participants

Describe your selection of the observational or

experimental participants (patients or laboratory animals, including controls) clearly, including eligibility and exclusion criteria and a description of the source population. The guiding principle should be clarity about how and why a study was done in a particular way. When authors use variables such as race or ethnicity, they should define how they measured the variables and justify their relevance.

(b) Technical Information

Identify the methods, apparatus (give the manufacturer's name and address in parentheses), and procedures in sufficient detail to allow other workers to reproduce the results. Give references to established methods, including statistical methods (see below); provide references and brief descriptions for methods that have been published but are not well known; describe new or substantially modified methods, give reasons for using them, and evaluate their limitations. Identify precisely all drugs and chemicals used, includ-ing generic name(s), dose(s), and route(s) of administration. Also describe diagnostic or therapeutic procedures if part of the study design.

(c) Statistics

Describe statistical methods with enough detail to enable a knowledgeable reader with access to the original data to verify the reported results. When possible, quantify findings and present them with appropriate indicators of measurement error or uncertainty (such as confidence intervals). Define statistical terms, abbreviations, and most symbols. Specify the computer soft-ware used.

6. Results

Present your results in logical sequence in the text, tables, and illustrations, giving the main or most important findings first. Do not repeat in the text all the data in the tables or illustrations; emphasize or summarize only important observations.

When data are summarized in the Results section, give numeric results not only as derivatives (for example, percentages) but also as the absolute numbers from which the derivatives were calculated, and specify the statistical methods used to analyze them. Restrict tables and figures to those needed to explain the argument of the paper and to assess its support. Use graphs as an alternative to tables with many entries; do not duplicate data in graphs and tables.

7. Discussion

Emphasize the new and important aspects of the study and the conclusions that follow from them. Do not repeat in detail data or other material given in the Introduction or the Results section. For experimental studies it is useful to begin the discussion by summarizing briefly the main findings, then explore possible mechanisms or explanations for these findings, compare and contrast the results with other relevant studies, state the limitations of the study, and explore the implications of the findings for future research and for clinical practice.

Link the conclusions with the goals of the study but avoid unqualified statements and conclusions not adequately supported by the data. Avoid claiming priority and alluding to work that has not been completed. State new hypotheses when warranted.

8. References

(a) General Considerations Related to References

Although references to review articles can be an efficient way of guiding readers to a body of literature, review articles do not always reflect original work accurately. Small numbers of references to key original papers will often serve.

Avoid using abstracts as references. References to papers accepted but not yet published should be designated as “in press” authors should obtain written permission to cite such papers as well as verification that they have been accepted for publication. Informa-tion from manuscripts submitted but not accepted should be cited in the text as “unpublished observations” with written permission from the source.

Avoid citing a “personal communication” unless it provides essential information not available from a public source, in which case the name of the person and date of communication should be cited in parentheses in the text. For scientific articles, authors should obtain written permission and confirmation of accuracy from the source of a personal communication.

For articles published in journals indexed in MEDLINE, the Pakistan Journal of Plastic Surgery considers PubMed (http://www.pubmed.gov) the authoritative source for information about retractions.

(b) Reference Style and Format

The Uniform Requirements style is based largely on an ANSI standard style adapted by the National Library of Medicine (NLM) for its databases. For samples of reference citation formats, authors should consult National Library of Medicine web site.

References should be numbered consecutively in the order in which they are first mentioned in the text. Identify references in text, tables, and legends by Arabic numerals in parentheses. The titles of journals should be abbreviated according to the style used in Index Medicus. Consult the list of Journals Indexed for MEDLINE, published annually as a separate publication by the National Library of Medicine.

9. Tables

Tables capture information concisely, and display it efficiently; they also provide information at any desired level of detail and precision. Including data in tables rather than text frequently makes it possible to reduce the length of the text.

Type or print each table with double spacing on a separate sheet of paper. Number tables consecutively in the order of their first citation in the text and supply a brief title for each. Do not use internal horizontal or vertical lines. Give each column a short or abbreviated heading. Authors should place explanatory matter in footnotes, not in the heading. Be sure that each table is cited in the text.

10. Illustrations (Figures)

Figures should be either professionally drawn and photo-graphed, or submitted as photographic quality digital prints. In addition to requiring a version of the figures suitable for printing, Pakistan Journal of Plastic Surgery ask authors for electronic files of figures in a format (e.g., JPEG or GIF) that will produce high quality images in the web version of the journal; authors should review the images.

For x-ray films, scans, and other diagnostic images, as well as pictures of pathology specimens or photomicrographs, send sharp, glossy, black-and-white or color photo-graphic prints, usually 127 x 173 mm (5 x 7 inches). Letters, numbers, and symbols on Figures should therefore be clear and even throughout, and of sufficient size that when reduced for publication each item will still be legible. Figures should be made as self-explanatory as possible, since many will be used directly in slide presentations. Titles and de-tailed explanations belong in the legends, however, not on the illustrations themselves.

Photomicrographs should have internal scale markers. Symbols, arrows, or letters used in photomicrographs should contrast with the background.

If photographs of people are used, either the subjects must not be identifiable or their pictures must be accompanied by written permission to use the photograph. When-ever possible permission for publication should be obtained.

Figures should be numbered consecutively according to the order in which they have been first cited in the text.

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Type or print out legends for illustrations using double spacing, starting on a separate page, with Arabic numerals cor-responding to the illustrations. When symbols, arrows, numbers, or letters are used to identify parts of the illustrations, identify and explain each one clearly in the legend.

12. Units of Measurement

Measurements of length, height, weight, and volume should be reported in metric units (meter, kilogram, or liter) or their decimal multiples.

Temperatures should be in degrees Celsius. Blood pressures should be in millimeters of mercury, unless other units are specifically required.

13. Abbreviations and Symbols

Use only standard abbreviations; the use of non-standard abbreviations can be extremely confusing to readers. Avoid abbreviations in the title. The full term for which

14. Drug Name

Generic names should be used. When proprietary brands are used in research, include the brand name and the name of the manufacturer in parentheses after first mentioning of the generic name in the Methods section.

15. Guidelines for Authors and Reviewers

All material submitted for publication should be sent exclusively to the Pakistan Journal of Plastic Surgery. Work that has already been reported in a published paper or is described in a paper sent or accepted elsewhere for publication, should not be submitted. Multiple or duplicate submission of the same work to other journal should be avoided as this fall into the category of publication fraud and are liable for disciplinary consequences, including reporting to Pakistan Medical & Dental Council and Higher Education Commission. A complete report following publication of a preliminary report, usually in the form of an abstract, or a paper that has been presented at a scientific meeting, if not published in full in a proceedings or similar publication, may be submitted. Press reports of meetings will not be considered as breach of this rule, but additional data or copies of tables and illustrations should not amplify such reports. In case of doubt, a copy of the published material should be included with a

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It is mandatory to provide the institutional ethical review board / committee approval for all research articles, at the time of submission of article.

The editors reserve the right to edit the accepted article to conform to the house-style of the Journal.

16. General archival and linguistic instructions

Authors should submit the manuscript typed in MS Word. Manuscripts should be written in English in British or American style/format (same style should be followed throughout the whole text), in past tense and third person form of address. Sentences should not start with a number or figure. Any illustrations or photographs should also be sent in duplicate. Components of manuscript should be in the following sequence: a title page (containing names of authors, their postal and Email addresses, fax and phone numbers, including mobile phone number of the corresponding author), abstract, key words, text, references, tables (each table, complete with title and footnotes) and legends for llustrations and photographs. Each component should begin on a new page. The manuscript should be typed in double spacing as a single column on A4 (8-1/2" x 11" or 21.5 cm x 28.0 cm), white bond paper with one inch (2.5 cm) margin on one side.

Sub-headings should not be used in any section of the script except in the abstract. In survey and other studies, comments in verbatim should not be stated from a participating group. Acknowledgements are only printed for financing of a study or for acknowledging a previous linked work.

From January 2016, all randomized trials should also provide a proof of being registered at the **International RCT Registry.**

17. Material for Publication

The material submitted for publication may be in the form of an Original research (Randomized controlled trial - RCT, Meta-analysis of RCT, Quasi experimental study, Case Control study, Cohort study, Observational Study with statistical support etc), a Review Article, Commentary, a Case Report, Recent Advances, New techniques, Debates, Adverse Drug Reports, Current Practices, Clinical Practice Article, Short Article, KAP (Knowledge, Attitudes, Practices) study, An Audit Report, Evidence Based Report, Short Communication or a Letter to the Editor. Ideas and Innovations can be reported as changes made by the authors to an existing technique or development of a new technique or instrument. A mere description of a technique without any practical experience or innovation will be considered as an update and not an original article. Any study ending three years prior to date of submission is judged by Editorial Board for its suitability as many changes take place over the period of time, subject to area of the study. Studies more than three years old are not entertained. In exceptional cases, if Editorial Board is of the view that data is important, an extension of one year may be granted. Pakistan Journal of Plastic Surgery also does not accept multiple studies/multiple end publications gathered/derived from a single research project or data (wholly or in part) known as 'salami slices'.

Original articles should normally report original research of relevance to clinical medicine. The original paper should be of about 2000-2500 words excluding abstract and references. It should contain a structured abstract of about 250 words. Three to 10 keywords should be given for an original article as per MeSH (Medical Subject Headings). There should be no more than three tables or illustrations. The data should be supported with 20 to 25 references, which should include local as well as international references. Most of the references should be from last five years from the date of submission.

Clinical Practice Article is a category under which all simple observational case series are entertained. The length of such article should be around 1500 - 1600 words with 15 - 20 references. The rest of the format should be that of an original article. KAP studies, Audit reports, Current Practices, Survey reports and Short Articles are also written on the format of Clinical Practice Article. Evidence based reports must have at least 10 cases and word count of 1000 - 1200 words with 10 - 12 references and not more than

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Review article should consist of critical overview/analysis of some relatively narrow topic providing background and the recent development with the reference of original literature. It should incorporate author's original work on the same subject. The length of the review article should be of 2500 to 3000 words with minimum of 40 and maximum of 60 references. It should have non-structured abstract of 150 words with minimum 3 key words. An author can write a review article only if he/she has written a minimum of three original research articles and some case reports on the same topic.

Letters should normally not exceed 400 words, with not more than 5 references and be signed by all the authors-maximum 3 are allowed. Preference is given to those that take up points made in contributions published recently in the journal. Letters may be published with a response from the author of the article being discussed. Discussions beyond the initial letter and response will not be entertained for publication. Letters to the editor may be sent for peer review if they report a scientific data. Editorials are written upon invitation.

Between 3 to 10 key words should be given for all the category of manuscripts under the abstracts as per mesh [medical subject heading].

18. Thesis Based Article

Thesis based article should be re-written in accordance with the journal's instructions to the author guidelines.

Article shall undergo routine editorial processing including external review based upon which final decision shall be made for publication. Such articles, if approved, shall be published under the disclosure by author that 'it is a Thesis based article'.

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If tables, illustrations or photographs, which have already been published, are included, a letter of permission for re-publication should be obtained from author (s) as well as the editor of the journal where it was previously published. Written permission to reproduce photographs of patients, whose identity is not disguised, should be sent with the manuscript; otherwise the eyes will be blackened out. If a medicine is used, generic name should be used. The commercial name may, however, be mentioned only within brackets, only if necessary. In case of medicine or device or any material indicated in text, a declaration by author/s should be submitted that no monetary benefit has been taken from manufacturer/importer of that product by any author. In case of experimental interventions, permission from ethical committee of the hospital should be taken beforehand. Any other conflict of interest must be disclosed. All interventional studies submitted for publication should carry Institutional Ethical & Research Committee approval letter.

Ethical consideration regarding the intervention, added cost of test, and particularly the management of control in case-control comparisons of trials should be addressed: multi-centric authors' affiliation may be asked to be authenticated by provision of permission letters from ethical boards or the heads of involved institutes.

20. Authorship Criteria

As stated in the Uniform Requirements, credit for authorship requires substantial contributions to (a) the conception and design or analysis and interpretation of the data, (b) the drafting of the article or critical revision for important intellectual content, critical appraisal of findings with literature search and actual write up of manuscript, (c) final approval of the version to be published. Each author must sign a statement attesting that he or she fulfills the authorship criteria of the Uniform Requirements.

The Journal discourages submission of more than one article dealing with related aspects of the same study. The journal also discourages the submission of case reports unless unreported from Pakistan. Unusual but already reported cases should, therefore, be submitted as letters to the editor.

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