PAKISTAN JOURNAL OF PLASTIC SURGERY

Publisher: Pakistan Association of Plastic Surgeons
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Marjolin's Ulcer: A Preventable Cancer

Muhammad Saleem, Moazzam N. Tarar, Husnain Khan, Ata Ul Haq

Abstract

Marjolin's ulcer is cutaneous malignant tumor arising from chronically inflamed or traumatized skin. It commonly occurs in burn scars but can also originate from venous ulcers, pressure sores and chronic osteomyelitis sinuses.

The major risk factors for development of neoplasms are healing by secondary intention, non-healing wounds and fragile scars that ulcerate easily.

Our series reviews 17 cases of Marjolin's ulcer, who presented at Plastic Surgery Department Jinnah Hospital Lahore from June 2005 to June 2011. In 11 cases Marjolin's ulcer occurred after burns and six after traumatic wounds. In 16 cases wound had healed by secondary intention. After establishing diagnosis by incisional biopsy, 16 cases underwent wide excision and skin graft or flap for coverage. Below knee amputation was performed in one patient. Three patients had recurrence and above-knee amputation was performed in one patient, he is disease free one year after the amputation. Two patients died who had recurrence over scalp. Mean follow up period was 3 years. Three patients were lost to follow-up and 12 cases were tumor-free during the follow-up period.

We concluded that cure rate for early cases is high as compared with advanced cases. Marjolin's ulcer can be prevented by promoting wound healing by primary intention and early coverage of wound defects with graft or flap.

Key Words: Preventable cancer

Introduction

Marjolin's ulcer is cutaneous malignant tumor arising from chronically inflamed or traumatized skin. It commonly occurs in burn scars but can also originate from venous ulcers; pressure sores traumatic wounds, cystostomy sites, scarring from lupus, amputation stumps, chronic lymphedema, chronic pilonidal sinuses, hidradenitis suppurativa, chronic ulcers of leprosy and chronic osteomyelitis sinuses.

Malignant degeneration in post burn scar was first described by French Surgeon Jean-Nicolas Marjolin in 1828. In 1903, DaCosta suggested that carcinomatous change takes place in a chronic ulcer; indurations usually begin from around the margin and spread slowly. It is rare for the entire margin of a large ulcer to transform into a malignant disease.

Incidence of Marjolin's ulcer is 1.7% in chronic wounds. All parts of the body can be affected but it most frequently occurs over the scalp and extremities.

Exact pathogenesis is unknown. Marjolin's ulcers are thought to be due to long-term, continuous mitotic activity as the epidermal cells attempt to resurface the open defect. This cycle of damage, irritation, and repair especially in flexion creases, can lead to a malignant transformation.

Two variants have been recognized. In Acute variant malignant degeneration occurs within one year. In Chronic variety, it occurs after more than one year. Latent transformation period for chronic variant ranges from 25 to 40 years.

The most common histological type is squamous cell carcinoma. Other types include basal cell carcinoma, Malignant fibrous histiocytoma, malignant melanoma, liposarcoma, fibrosarcoma, neuroendocrine (Merkel cell) carcinoma, and keratoacanthoma.

SCC developing in a Marjolin's Ulcers are reported to be more aggressive than other skin cancers of the same cell type arising de novo.

Prognosis worsens with higher grades; thus...
Lifeso et al. described three grades (well differentiated, moderately differentiated and poorly differentiated). Marjolin's ulcers have 30-40% rate of metastasis.11

Materials and Methods
We retrospectively analyzed the case records of 17 patients of Marjolin's ulcer, who presented at Plastic Surgery Department Jinnah hospital Lahore from June 2005 to June 2011. Diagnosis was made on the basis of history, clinical examination and biopsy. Preoperative evaluation with CT scan or MRI was done for local extent of tumor and lymph nodes metastasis while distant metastasis was ruled out by CT scan, ultrasound abdomen, X ray chest and bone scan (if required). Tumor grading and histological type was determined from biopsy. In 16 cases tumors were excised with 2 cm wide margin of clinically involved area and after biopsy proven tumor negative margin on frozen section coverage was provided with graft or flap. Below knee amputation was done in one case due to lower tibia involvement. Post operative radiotherapy was given in patients who had tumor size more than 10 cm, regional lymph node involvement and high grade tumors (grade 3). All patients were followed up for recurrence.

Results
Initial cause of injury was burns (70%), traumatic wounds (24%) and chronic osteomyelitis (6%). Seven patients were male and ten were female. Mean age of presentation was 48 years (22-68 years).

Latent period ranged from 8 months to 50 years with mean of 28 years. 76% of tumors were located over extremities, 18% over scalp and 6% over trunk. Histological types were Squamous cell carcinoma (94%) and basal cell carcinoma (6%). One patient (6%) developed acute Marjolin's ulcer. Rest had chronic Marjolin's ulcer (94%). Lymph node involvement and distant metastasis was not seen in any case. (Table 1)

All patients were followed up for recurrence ranging from 1.5 to 3.5 years with mean period of follow-up of 3 years. Three patients (18%) had recurrence. Mean period of recurrence was 6 months. Two patients with scalp Marjolin's ulcer had recurrence and died with aggressive involvement of dura and brain. One patient had recurrence at knee joint and above knee amputation was done and he is disease free for past one and half years. Three patients (18%) were lost to follow up. 12 cases (70%) are disease free now. (Table 2)
**Table 2**

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<table>
<thead>
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<tr>
<td>Initial wound healing</td>
<td>Secondary intention 94%</td>
</tr>
<tr>
<td>Tumor excision</td>
<td>Wide local excision, 16 (94%)</td>
</tr>
<tr>
<td></td>
<td>Below knee amputation, 1 (6%)</td>
</tr>
<tr>
<td>Wound coverage</td>
<td>7 cases Skin graft (41%)</td>
</tr>
<tr>
<td></td>
<td>9 cases Flap (59%)</td>
</tr>
<tr>
<td>Post-op Radiotherapy</td>
<td>7 cases (41%)</td>
</tr>
<tr>
<td>Follow up</td>
<td>1.5-3.5 years (mean, 3 years)</td>
</tr>
<tr>
<td>Recurrence</td>
<td>3 cases (18%), mean period 6 months</td>
</tr>
<tr>
<td>Lost to follow up</td>
<td>3 cases (18%)</td>
</tr>
<tr>
<td>Died</td>
<td>2 cases (12%)</td>
</tr>
<tr>
<td>Disease free</td>
<td>12 cases (70%)</td>
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**CASE 1**

40 years female presented with Marjolin's ulcer popliteal region for 03 years. She had history of flame burn twenty years back. There was no lymph node, bony or neurovascular involvement. Incisional biopsy revealed low grade Squamous cell carcinoma. Wide local excision of tumor with 2cm margin done and defect covered with skin graft. Post operative radiotherapy was not given and patient is disease free for past 02 years. (Fig 1-4).

**Case 2**

60 years male presented with non healing ulcer over right middle third of leg for past 03 years. He had history of flame burns 40 years back which healed by secondary intention. Preoperative evaluation didn't show lymph node or bony involvement. Histology revealed moderately differentiated SCC. Tumor was excised with 2cm margin. Tibia was exposed in middle third of leg. After negative resection margin confirmation by frozen section, defect was covered with proximally based medial hemisoleus flap. Post operatively patient received radiotherapy and he is disease free for past three years. (Fig 5-9).
Case 3
48 years male presented with recurrent Marjolin’s ulcer over knee for 03 years. He had history of flame burn 35 years ago which healed by secondary intention. He had already undergone tumor excision and postoperative radiotherapy 02 years back. MRI knee showed the involvement of knee joint capsule. Orthopedic opinion was to salvage knee joint by doing capsulotomy. Tumor was excised with 2cm margin, capsulotomy of knee joint was performed and defect was covered with vastus lateralis muscle flap and split thickness skin graft. Post operative radiotherapy was not given because patient had already received full dose of radiation, as advised by radiotherapist. Tumor recurred after 6 months and above knee amputation was done. (Fig10-14)
Case 4

17 years female presented with non healing wound leg for 12 years following degloving injury. Preoperative evaluation showed involvement of tibia. Below knee amputation with stump formation done using fillet flap of foot and split thickness skin graft. Post operative radiotherapy was given. Patient is disease free for past three years. (Fig 15-18)
Case 5

18 year female presented with non healing ulcer scalp for 06 months. She had toka machine avulsion injury of scalp 09 months back and wound was covered with split thickness graft. Histology revealed poorly differentiated SCC. Preoperative evaluation showed the involvement of outer and inner tables of skull. Excision was done by neurosurgery team with removal of outer and inner tables. Dura was involved by tumor, but dura was not excised because tumor was overlying superior sagittal sinus. Currettage of dura was performed and defect was covered with free Latissmus dorsi flap with skin paddle. Post operative radiotherapy was given. Patient died after 03 months due to invasion of brain by tumor. (Fig 19-22)

Discussion

Marjolin's ulcer is aggressive malignancy with worse prognosis than any other skin malignancy. Best form of management is to prevent development of Marjolin's ulcer by promoting primary wound healing. In our study 94% of our patients of Marjolin's ulcer, initial wound healing occurred by secondary intention. Healing by secondary intention promotes unstable scarring and non healing ulcers. There should be high index of suspicion for development of Marjolin's ulcer in patients in whom wounds healed by secondary intention. Ulcer features that are suggestive of malignant transformation include a chronic ulcer of greater than three months’ duration, excessive granulation tissue beyond margins, everted wound edges, recurrent breakdown of ulcers after healing, static non healing ulcers after appropriate treatment, and ulcers that increase in size or pain despite appropriate therapy. These non healing wounds should be biopsied especially when there is change in nature of ulcer. Lawrence suggested that specimens be taken from both the center and the margins of suggestive lesions.
Preoperative evaluation should be done to rule out lymphatic involvement and distant metastasis. Prognosis worsens with lymphatic involvement. Wide local excision with 2cm margin should be taken. Amputation is indicated in case of bone or joint involvement, involvement of neurovascular tissue, extensive infection, hemorrhage (erosion of vessel) or excision impairs function. Lymph node dissection is indicated when lymph nodes are suspected on palpation or radiological imaging. Role of sentinel lymph node biopsy is controversial.

Flap coverage is required when vital structures are exposed (neurovascular bundle, bone or joint, tendon) or patient needs post operative radiotherapy. Indications for radiotherapy are:

1. Inoperable regional lymph node metastasis.
2. Grade 3 lesions with positive lymph nodes after regional lymph node dissection.
3. Tumors with a diameter greater than 10 cm and with positive lymph nodes after regional lymph node dissection.
4. Grade 3 lesions with a tumor diameter greater than 10 cm and negative lymph nodes after regional lymph node dissection.
5. Lesions of the head and neck with positive lymph nodes after regional lymph node dissection.

Long-term follow-up is recommended in all cases of Marjolin's ulcer. We had 18% recurrence in our cases. Most series indicate that the incidence of recurrence is in the range of 20% to 50%.

Conclusion

• Marjolin's ulcer can be prevented by promoting wound healing by primary intention and early coverage of wound defects with graft or flap.
• Index of suspicion should be high for patients in whom wounds healed by secondary intention.
• Chronic wounds should be biopsied to rule out Malignancy esp. when there is change in nature of ulcer.
• Marjolin's ulcer of head and neck should be treated more aggressively in term of excision and adjuvant radiotherapy, chronic ulceration, or Marjolin's ulcer. Ann Surg. 1903; 37: 496 – 502. with modern • Limb salvage is possible reconstructive options.

References
Salvage of Infected Tissue Expanders
Myth or Truth

Nadeem Yousaf M.B.B.S, Muhammad Mustehsan Bashir FCPS (Surg), FCPS( Plastic Surg), Farid Ahmad Khan FCPS ( Plastic Surg), FRCS(Edn)

Abstract
The use of tissue expander has become a popular and well established technique for soft tissue reconstruction. Infection is the most common and devastating complication, traditionally treated by removal of the infected implant. The study demonstrates the results of attempted salvage of infected expanders.

This case series was done at department of Plastic surgery, KEMU, Lahore from Sep, 2006 to Aug, 2010. Medical record of all the patients undergoing reconstruction with tissue expanders was reviewed and cases complicated by infection of surgical site were selected for the study. Minor wound infections (presence of pain or tenderness, localised swelling, redness or heat and serous drainage from the incision singly or in any combination and involving the skin, subcutaneous tissue and fascia around the expander or filling port) were treated by temporarily stopping the expansion and starting antibiotics according to culture and sensitivity. Cases of major wound infection (purulent discharge with partial or total dehiscence of the wound and exposure of expander) were treated differently in each case.

Twelve cases of tissue expansion out of 35 (34.28%) got infection. Eleven were salvaged successfully (91%). Seven cases had minor soft tissue infection and five cases had major form of infection. Cases of minor wound infection were all successfully salvaged at the expense of brief delay in expansion (average 3.5 weeks) till the settlement of infection. Two cases of purulent discharge from the port site were salvaged by exteriorizing the port and halting the expansion for two week. Three cases of major infection involving the expander had partial dehiscence of the wound with exposure of implant. Two of these cases were successfully salvaged.

In conclusion successful salvage of infected tissue expander should be attempted with a reasonably good outcome.

Key Words: Tissue expanders infected.

Introduction
Replacing like with like is the essence of reconstruction. Expansion of adjacent skin allows surgeons to cover defects with local skin that matches the area of reconstruction in texture, colour, thickness, hair bearing capability and sensation. Becoming increasingly popular, tissue expansion has established itself as the reconstructive method of choice for many congenital and acquired defects in children and adults because donor site morbidity is minimal and aesthetic results are superior.

Complication rates of 5 to 60 percent have been reported when performing tissue expansion. Complications can be minor- allowing the expansion to be completed and not affecting the final outcome. Major complications interfere with the inflation of expander and include infection ranging from minor to severe forms. Minor infection (presence of pain or tenderness, localised swelling, redness or heat and serous drainage from the incision singly or in any combination and involving the skin, subcutaneous tissue and fascia around the expander or filling port) leads to delay in planned expansion. Major infection (purulent discharge with partial or total dehiscence of the wound and exposure of expander) threatens the loss of expander. Once the course of expansion fails because of infection, customarily removal of the implant has been the basis of treatment. Since the removal of an infected tissue expander is very disappointing to both the surgeon and the patient, every effort is directed to its salvage.

Historically, universal practice was the instantaneous taking away of the infected or exposed expander16,17. Nevertheless, the modern plastic surgery text has investigated
opportunities for device rescue. With the fast advancement in the field of microbiology and advent of newer antibiotics, surgeons took courage and started attempts to salvage the infected tissue expanders. The strategies to deal with the infection included wound wash with normal saline and/or wash with antibiotics solutions, systemically given intravenous antibiotics according to culture and sensitivity, capsulotomy and device exchange, and exteriorization of the ports. Thus by different ways surgeons try to gain maximum expansion while dealing with infection.

In spite of a number of reports centering on management of the infected or exposed tissue expanders, there is existing disagreement as regards the understanding of and suggestions for device salvage and the best modus operandi. It is probably important for plastic surgeons to describe a superior set of guiding principles concentrating on the subject keeping in mind the clinical, psychological and financial problems associated with possible expander loss. Victorious expander rescue offered to correctly chosen patients would be a highly desirable alternative to loss of an implant.

The rationale of our study was to observe the impact of tactics used to combat infection of tissue expanders so that surgeons can make more enlightened judgment regarding the possibility of saving a threatened implant. The objective of this study was to describe the outcome of strategies used to salvage the infected tissue expanders.

Patients and Methods:

This case series was done at department of Plastic surgery, KEMU, Mayo hospital Lahore from Sep, 2006 to Aug, 2010. Medical record of all the patients undergoing reconstruction with tissue expanders was reviewed and cases complicated by surgical site infection were selected for the study. All the patients had received first generation cephalosporin for seven days post operatively. Minor infection was defined as presence of pain or tenderness, localised swelling, redness or heat and serous drainage from the incision singly or in any combination and involving the skin, subcutaneous tissue and fascia around the expander or filling port. Major infection was defined as purulent discharge with partial or total dehiscence of the wound and exposure of expander. Salvage was defined as successful completion of expansion. Failure to salvage was defined as premature removal of expander with suboptimal expansion. In cases of minor infection, wound discharge was sent for culture and sensitivity and empirical antibiotics were started against gram positive cocci. Antibiotics were changed according to culture and sensitivity report. The antibiotics were continued for two weeks. The process of expansion continued during the antibiotics course.

The patient were analysed on the basis of management of infection and outcome. These outcomes were of three type's e.g completion of successful expansion, early removal of expander secondary to infection with successful expansion.

Results:

Ten cases out of fifteen had tissue expander infection. One expander was used in each case. Data collected on the expansion process, complications and outcome are summarized in table-1.
Table: 1
Expansion Data, Complications and Outcome in the Infected Expander Patients

<table>
<thead>
<tr>
<th>Total</th>
<th>Sex</th>
<th>Age</th>
<th>Region</th>
<th>Volume (cc)</th>
<th>No. of starting antibiotic treatment</th>
<th>Time of Expander</th>
<th>Complications</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>18</td>
<td>Neck</td>
<td>450</td>
<td>18</td>
<td>10</td>
<td>Skin redness, incision relative to No. of margin dehiscence, successful expansion extrusion (1cm gap) reconstruction</td>
<td>Earlier removal with 10 successful reconstruction</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>29</td>
<td>Scalp</td>
<td>430</td>
<td>16</td>
<td>12</td>
<td>Skin redness</td>
<td>Successful Reconstruction</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>14</td>
<td>Scalp</td>
<td>380</td>
<td>14</td>
<td>8</td>
<td>Skin redness, fluid collection, wound dehiscence</td>
<td>Earlier removal with successful reconstruction</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>22</td>
<td>Neck</td>
<td>410</td>
<td>16</td>
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<td>5</td>
<td>F</td>
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<td>Neck</td>
<td>380</td>
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<td>8</td>
<td>Skin redness</td>
<td>Successful Reconstruction</td>
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<td>F</td>
<td>28</td>
<td>Neck</td>
<td>390</td>
<td>16</td>
<td>10</td>
<td>Fever, skin redness</td>
<td>Successful Reconstruction</td>
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<tr>
<td>7</td>
<td>F</td>
<td>36</td>
<td>Breast</td>
<td>440</td>
<td>18</td>
<td>14</td>
<td>Fever, skin redness, wound dehiscence</td>
<td>Earlier removal, Successful Reconstruction</td>
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<tr>
<td>8</td>
<td>F</td>
<td>32</td>
<td>Breast</td>
<td>420</td>
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<td>Fever, skin redness</td>
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<td>16</td>
<td>12</td>
<td>Fever, skin redness</td>
<td>Successful Reconstruction</td>
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SALVAGE OF INFECTED TISSUE EXPANDERS- Myth or Truth

Nadeem Yousaf, Muhammad Mustehsan Bashir, Farid Ahmad Khan

Experience and subjective interpretation. In 1965 Perras introduced the concept of “salvage” of an infected implant. His input challenged surgical belief, which dictated foreign body removal in case of infection, and sparked the progression of device salvage. Relying on systemic antibiotic therapy and passive wound drainage, Courtiss et al. reported salvage rates of 44.8 for infected implants in the setting of breast augmentation. In 2004, Spear et al codified the aforementioned techniques of device salvage into an algorithm for the management of breast device infection and/or exposure. It helped move the topic from one of “do or do not” attempt device salvage to the next level, by shedding light on “how” and “when” instead.

Failure of expansion process and loss of implant causes psychological trauma to the patient. Moreover its economic implications are tremendous. In our unit traditional practice has been removal of infected tissue expander.

Despite a number of reports focusing on management of the infected or exposed breast prosthesis, there is still disagreement regarding the wisdom of and indications for device salvage and the optimal timing, setting, or technique. It would be valuable for plastic surgeons to better define a set of clinical guidelines addressing these very issues, given the medical, legal, psychological, and economic issues associated with possible implant loss. Device explantation is a traumatic event and, for practical purposes, represents the loss of a breast. Successful device salvage offered to properly selected patients with the greatest possibility of success would be a highly desirable alternative to loss of an implant.

Discussion:
Exposure of the implant with or without flap necrosis is an indication to abort the procedure and remove the implant. This usually results from inadequate dissection of the implant pocket with later suture line breakdown. Healing is allowed to occur and the process is repeated at a later time when indicated. However, some surgeons may opt to continue the expansion process if they determine that the infectious process does not jeopardize the site. This practice is not standard and is based only on anecdotal experience.

Conclusion:
The high expander rate of infection does not mean to preclude further expansion and successful reconstruction. It is our impression that having low threshold for placing patients on antibiotic treatment in the presence of early signs of expander infection results in prevention of infection and non-salvageable expander infection.
Reference:
Comparison Between Reversed Radial Forearm Flap and Reversed Posterior Interosseous Artery Flap for Hand Defects

Saad-Ur-Rehman Sarwar, Mamoon Rashid, Irfan Illahi, Rizwan Aslam, Shahid Hameed, Tahir Masood
Department of Plastic Surgery, Combined Military Hospital Rawalpindi

SUMMARY. This study highlights the outcome of the management of hand defects resurfaced either with reversed radial forearm (RRFA) flap or reversed posterior interosseous artery (RPIA) flap. Hand defects included were results of trauma due to road traffic accidents, blast / missile injuries and occupational injuries including industrial and agricultural accidents. A total of 92 patients with hand defects underwent the procedures over last six years, from January 2004 to October 2010. There was no significant gender predominance. Almost half of the defects were due to blast injury (45). Rests of the defects were either due industrial or agricultural accidents or due to road traffic accidents. In sixty patients, a reversed radial forearm flap, and in thirty two patients reversed posterior interosseous artery flap, was used to resurface the hand defect. In all the patients, a partial thickness skin graft was used to resurface the donor site. All flaps survived, but complications like wound infection, partial flap loss, donor site healing problems, flexor tendons exposure, weakness of arm or hand, nerve injury and cold intolerance did occur which all were with higher incidences in RRFA flap group. All the complications were managed accordingly. Careful comparison revealed that the reversed posterior interosseous artery meets almost all the prerequisites of the ideal flap for the reconstruction of the hand defects. Keeping in view its functional and aesthetic results, this flap, if feasible, should be considered as the treatment of choice in the reconstruction of the hand defects.

Keywords: radial forearm flap, posterior interosseous flap, hand reconstruction

Introduction:
Major tissue defects of the hand are commonly seen after trauma, missile and industrial injuries. Most are associated with damage or exposure of vital neurovascular, tendinous and skeletal structures, rendering them unsuitable for coverage by skin grafts and local flaps. Early skin coverage in these conditions is essential if optimal hand function is to be regained. There are several options for reconstructing defects involving skin loss over the hand. Conventionally these defects have been re-surfaced by random pattern abdominal or chest flaps and the groin flaps. Although these flaps combine ease of elevation with abundance of soft tissue, they have certain distinct disadvantages. They are frequently quite bulky resulting in poor cosmetic and functional results. It entails a two-stage procedure with the hand attached to the trunk usually for three to four weeks. In the setting of acute trauma it does not allow hand elevation or early restoration of movements. Since Yang Guo Fang's first description of a forearm flap based on the radial artery, the “Chinese flap” has established itself as a workhorse in hand reconstruction. Since then several other fasciocutaneous flaps from the forearm, like the ulnar forearm flap and the reversed posterior interosseous artery (RPIA) flap have been described. Increasing experience with microsurgery has resulted in free flaps like the temporoparietal fascia and lateral arm flap finding common usage in the hand. Among these the RPIA flap has gained increased popularity due to its thin and pliable skin and avoiding sacrifice of a major limb vessel. We have had the opportunity to use both the reversed radial forearm (RRFA) flap and the RPIA flap in patients with hand trauma. We present our comparison of these flaps in terms of application, ease of elevation, complications and donor site morbidity.

Materials and Methods
Between January 2004 and October 2010, 92 fasciocutaneous flaps based on the radial artery and posterior interosseous artery were used...
Comparison Between Reversed Radial Forearm Flap and Reversed Posterior Interosseous Artery Flap for Hand

to resurface various defects over the hand. There was a roughly an equal distribution amongst the sexes. These are shown in Table 1. The defects were due to blast injuries, industrial or agricultural accidents and road traffic accidents. Details are shown in Fig 1 and Fig 2.

Table 1 – Numbers of patients in each group

<table>
<thead>
<tr>
<th></th>
<th>RRFA FLAP</th>
<th>RPIA FLAP</th>
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<tbody>
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<td>Male</td>
<td>33</td>
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<td>Female</td>
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<td>15</td>
</tr>
<tr>
<td>Mean Age</td>
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</tbody>
</table>

Most of the patients (69) were secondary referrals having received their initial treatment elsewhere. In 59 patients the defect was located over the dorsum of the hand, in 12 patients it was over the thumb or first web area, over the palmer surface in 10 patients and around the wrist in 6 patients (Fig. 3). In five patients the flaps were used for thumb reconstruction.

Pre-operative evaluation included an assessment of the vascular, neurological and skeletal status of the involved hand. An Allen’s test was performed wherever feasible. In the other cases direct identification of the radial artery at the wrist and application of the bulldog clamp was performed to ensure the adequacy of the blood flow through ulnar vessels. Doppler was done for RPIA flap in cases of severe injuries around the wrist.

Before commencing flap elevation the wound was thoroughly debrided and any tendonous or neurovascular repair, if required, was carried out. Skeletal stabilization was achieved with K-wires. The techniques are well described for the elevation of reversed radial forearm flap and reversed posterior interosseous artery flap and no significant alteration was done in our cases.

The parameters recorded were applications of flaps, time of flap elevation, complications and donor site morbidity.

Table 2 Complications summary

<table>
<thead>
<tr>
<th>Complications</th>
<th>RRFA FLAP</th>
<th>RPIA FLAP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No of Patients</td>
<td>Percentage</td>
</tr>
<tr>
<td>1 Flap loss</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>→Complete</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>→Partial</td>
<td>0610</td>
<td>0.605</td>
</tr>
<tr>
<td>2 Partial loss of donor site skin graft</td>
<td>0915</td>
<td>Nil</td>
</tr>
<tr>
<td>3 Delayed donor site healing</td>
<td>6.604</td>
<td>6.610</td>
</tr>
<tr>
<td>4 Nerve injury</td>
<td>8.305</td>
<td>8.305</td>
</tr>
<tr>
<td>5 (Superficial Radial nerve)</td>
<td>16.610</td>
<td>16.610</td>
</tr>
<tr>
<td>6 Cold intolerance (hand)</td>
<td>0915</td>
<td>0915</td>
</tr>
<tr>
<td>7 Subjective weakness of arm</td>
<td>1525</td>
<td>1525</td>
</tr>
<tr>
<td>8 Weakness in grip strength</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>9 Poor aesthetic result</td>
<td>03</td>
<td>03</td>
</tr>
</tbody>
</table>
Results:

All flaps survived but partial flap loss was seen in six patients in whom RRFA flap was used. This was possibly due to damage to some part of the pedicle during flap elevation or acute kinking of the draining veins. Comparing the elevation, RRFA flap was a shorter duration procedure as it took 1 to 2 hours whereas RPIA flap required about 2 to 3 hours. Two of the RPIA flaps were delayed as they turned blue on inset. Wound infection requiring prolonged antibiotics or an ancillary procedure occurred in ten patients. All of these patients had presented late after severe initial trauma and the infective complication was probably due to inadequate debridement. In cases, with RRFA flap, 10 patients had poor skin graft take over the donor site that lead to the exposure of flexor tendons in four patients. On the other hand there was no such complication where RPIA flap was used. Delayed donor site healing was observed in five cases of RRFA flap and in two cases of RPIA flap. With use of RRFA flap, injury to superficial radial nerve was observed in twelve cases resulting in partial sensory loss over the effected area. While with the use of RPIA flap, in two patients, injury to posterior interosseous nerve was observed with a result of transient weakness of the effected motor units. When RRFA flap was used 10 patients suffered with cold intolerance. Restricted movements or weakness of the arm was noted in nine patients of the RRFA flap group and in two patients of the RPIA flap group. It was also observed that twelve patients of the RRFA flap group had weakness in the grip strength. Fifteen patients, with RRFA flap done, complained of poor aesthetic result whereas three patients complained the same from the other group. Complications have been summarized in

Table 2.

In all, except five patients of RRFA flap group and one patient of RPIA flap group, the objectives of the reconstruction was met successfully. It shows the use of RRFA and RPIA flaps for various hand reconstruction procedures

Discussion:

Increasing industrialization and escalation of urban violence in our society has led to a surge in the cases of major hand trauma presenting to Plastic Surgery departments. Blast and missile injuries, industrial trauma and road traffic accidents all pose a major danger to the integrity of the hand. Frequently these result in extensive damage to the skeletal framework and soft tissue envelope. If prompt and judicious repair of the damaged structures is not undertaken the long-term sequel in terms of loss of work and productivity can be catastrophic.

Our experience with both the RRFA and RPIA flaps, in treating hand defects, has been very gratifying. Although we are also using other methods of reconstruction like pedicled abdominal or chest flaps. The RRFA and RPIA flaps have become our preferred reconstruction option soft tissue defects of the hand. They are useful in all cases of acute hand trauma in which there is co-existing skeletal or tendon injury. It allows for prompt coverage with well vascularised tissue in a single stage. The hand can be elevated to reduce post-traumatic edema and early hand mobilization can be achieved. These advantages have also been noted by other authors. Both the RRFA and RPIA flaps provide thin and pliable skin. In these flaps, complete flap loss is rare but partial losses do occur possibly due to damage to the some part of the pedicle during flap elevation or acute kinking of the draining veins. To reduce donor site complications we are more careful in dissections, to preserve the paratenon, and using unmeshed partial thickness skin grafts to resurface the donor site. Some of the authors are also using fascial flaps with grafts, for reconstruction of hand defects, to reduce the incidence of donor site complications.

In comparison donor limb morbidity is higher in case of RRFA flap, because it sacrifices a major limb vessel leading to cold intolerance, in the hand, in the significant number of patients.
Moreover the incidences of restricted arm movements, subjective weakness and the weakness in the grip strength are also significantly higher in the RRFA flap group. Mainly it is due to the direct involvement of the flexor tendons in the procedure and comparatively prolonged immobilization to avoid shearing under the split thickness skin graft over the donor site. Problems concerning the take of skin grafts at the donor sites are also more frequent with RRFA flaps which usually results in the exposure of the flexor tendons thus necessitating an ancillary procedure. Both of these flap procedures pose the risk of nerve injuries, superficial radial is nerve at risk in the elevation of RRFA flap and its injury leads to partial or complete loss, of sensations of the area supplied, depends upon the nature of injury. In case of RPIA flap, posterior interosseous nerve is at risk, injury leads to transient or permanent loss of movements of the supplied motor unit, but the incidence is lower than the injury to superficial radial nerve while elevating the RRFA flap.

Application of both the flaps for resurfacing hand defects is more or less same. RPIA flap can be used to resurface small to medium sized defects and for the larger defects RRFA flap is preferred. Comparing the elevation, RRFA flap is a shorter duration procedure as it takes 1 to 2 hours whereas RPIA flap takes about 2 to 3 hours. RRFA flap is an easy flap to teach residents, on the other hand posterior interosseous artery is comparatively a small vessel thus the dissection of this flap is more tedious and time-consuming job. Moreover the RPIA flap cannot be used in case of dorsal carpal injury.

Conclusion:
Our experience of reconstruction of hand defects with reversed radial forearm flap and reversed posterior interosseous artery flap in 92 patients, concludes that, both the reversed radial forearm and reversed posterior interosseous artery flaps, are very versatile and reliable flaps. After comparing all the aspects governing the final outcome of any reconstructive procedure, it is further concluded that, the reversed posterior interosseous artery flap is superior that meets almost all of the anatomic prerequisites for the ideal hand flap. It facilitates the restoration of normal hand contour by replacing “like-with-like,” and it also achieves excellent aesthetic results. We found it the treatment of choice for resurfacing the defects of the hand.

References:
INTRODUCTION A major goal of the initial management of burn injuries is to replace extra cellular fluid loss proportional to percent total body surface area (% TBSA) and to maintain tissue perfusion. Early aggressive treatment of burn shock has been the mainstay of burns resuscitation but recently there have been growing concerns that burn injured patients are being over fluid-resuscitated with excessive quantities of crystalloid in first 24 hours after burns. [1-4].

The term used for excessive fluid resuscitation is "fluid creep" [2] Excessive fluid resuscitation increases the chances extremity compartment syndrome abdominal compartment syndrome and acute respiratory distress syndrome (ARDS) [5-8].

In large burns intravenous fluid therapy in the basic protocol this avoid life threatening hypovolaemic shock and for this a number of resuscitation formulae are advocated [9]. The most commonly practiced formula is Parkland formula, developed by Baxter and Shires in 1968 which calculate total fluid requirements (ringer's lactate) in the first 24 hours has from injury as 4ml/kg/% TBSA[10,11].

The sodium load delivered with Parkland form is 0.6 mm /kg/ % TBSAduring first 24 hours. More recently fluid resuscitation in excess of Parkland formula has been observed [12-16]. This trend raises concerns as to the adequacy of the formula and complications associated with over-resuscitation which can limit perfusion to potentially recoverable burns and body organs not directly injured.

Keywords: Fluid resuscitation major burns fluid creep.

MATERIAL & METHOD RESULTS

The study was conducted at Burn Care Center Pakistan Institute of Medical Sciences (PIMS), Islamabad, a tertiary referral center for burns, % TBSA burn. Fluid resuscitation was started by calculating fluids as 2ml/kg/%TBSA of the country.

Inclusion criteria were admission to burn care crystalloids (Ringer’s Lactate) fluid for 1 24 hours, half TBSA presented within 04 hours of injury during the volume administered in 1 8 hours the study period, January 1, 2011 to December 31, and half in next 16 hours. Colloids are also added in the 2 phase of 16 hours. Volumes are injured patients treated at this center in the previous year from the record. For those patient according to urine output. Where fluid records for 1 output. In the 2 24 hours 5%

48 hours were D/W replaces the Ringer’s Lactate.

INC of acute burns injuries more than 20 %, hours, half TBSA presented within 04 hours of injury during the volume administered in 1 8 hours the study period, January 1, 2011 to December 31, and half in next 16 hours. Colloids are also added in the 2 phase of 16 hours. Volumes are injured patients treated at this center in the previous year from the record. For those patients according to urine output. Where fluid records for 1 output. In the 2 24 hours 5%

Compartment Syndrome Extremity

Failure, sepsis and death

<table>
<thead>
<tr>
<th>Compartment</th>
<th>01</th>
<th>04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syndrome Abdominal</td>
<td>04</td>
<td>06</td>
</tr>
<tr>
<td>ARDS</td>
<td>03</td>
<td>06</td>
</tr>
<tr>
<td>Sepsis</td>
<td>Nil</td>
<td>02</td>
</tr>
<tr>
<td>Renal Failure</td>
<td>Nil</td>
<td>02</td>
</tr>
<tr>
<td>CVS Failure</td>
<td>21</td>
<td>06</td>
</tr>
<tr>
<td>Deaths</td>
<td>02</td>
<td>17</td>
</tr>
<tr>
<td>Hospital Stay less than 03 weeks</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>Hospital stay more than 03 weeks</td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>
DISCUSSION

Despite years of experience with burn shock resuscitation this survey supports that concept that many controversies persist in treating burn patients in the first 24 h after injury. Clearly, many variations exist in resuscitation practices around the world. Such variation suggests that no particular formula or practice works better than another. Despite variations in practice, the Parkland formula which was created four decades ago persists as the favorite formula. In addition, lactated Ringer’s solution, the fluid choice of the Parkland formula also dominates throughout the world. It is unclear whether the Parkland formula is favored because it is better or because it is the simplest and least expensive method of resuscitation. I suspect that simplicity has a great deal to do with its domination. Fortunately, most burn physicians do not rely solely on the formula but adjust the fluid based on the physiologic response of the patient.

It is also clear that colloids are starting to increase their presence in resuscitation practices. Twenty years ago we were taught that colloids were unnecessary and should never be used. Most surgeons now “cheat” by adding some form of colloids during the first 24 hours after injury. In my practice, I have been adding colloids earlier during resuscitation with what appears to benefit the patient. Many physicians are now starting resuscitation with either albumin or fresh frozen plasma. Slater’s group has presented the use of a formula based on lactated Ringer’s solution and fresh frozen plasma [11]. In China, the Third Military Medical University has a formula based on the use of a combination of crystalloid and colloid [15]. The Haifa formula is based on the use of plasma and crystalloid [16]; and finally, Demling has recommended the use of dextran and fresh frozen plasma [17]. After discussion at the 2006 State of the Science Meeting it has become apparent that the question of whether to use crystalloid or colloid during resuscitation has become a key question that needs to be answered [10].

The issue of “fluid creep” is on everyone’s mind [1-4]. We do not want to over-resuscitate patients and suffer complications of ARDS and compartment syndromes.

There are many potential causes of “fluid creep”. One major reason for over-resuscitation is simply not paying attention to detail. Many of the report on “fluid creep” suggest that urine output was above the target but the fluid rates were not decreased.

Regarding oral resuscitation in burns in the developed countries there really is little need for such a strategy since intravenous access is nearly automatic. In undeveloped countries there is clearly a need for such a strategy. Clearly, oral resuscitation protocols work well for cholera epidemics so they should help in at least medium sized burns [20,21]. Some form of oral resuscitation strategy would be great benefit during a disaster when intravenous resources become overwhelmed. Oral resuscitation should be explored in the future.

5. Conclusion

The large variance in formulas and fluid choices simply tell us that no protocol is perfect. The use of colloids is increasing so it is time to perform a prospective, randomized trial to determine whether there is a better way to treat burn shock. “Fluid creep” continues to plague resuscitation but the causes are not clear. Despite decades of using formulas we still have a long way to go to optimize burn shock resuscitation.
References:


Burn injury is one of the major causes of morbidity and mortality in Pakistan. There is no study done so far which reflects exact incidence of burn in Pakistan. One study suggests that in Pakistan one person gets burn after every 5 minutes. One out of ten who get burnt needs treatment at an intensive care unit. One out of five who got admission succumbs to his/her injuries. Management of the burns is highly expensive. It entails the admission to ICU, use of intravenous crystalloids and colloids, broad spectrum antibiotics, multiple grafting sessions, management on ventilator, physiotherapy, hydrotherapy, and social rehabilitation.

A third world country like Pakistan where 0.6% of GDP is spent on health by the Government and where per capita income is less than 5 US$, the treatment of major burn is beyond the limits of common person. Because of high cost of treatment and high mortality, most of the private hospitals also do not take burn patients. They take their refuge in the excuse of lacking Burn ICU in their hospitals. That’s why most of the burn patients are referred to Government run hospitals.

The other factor that is hampering cost effective treatment in burns is the paucity of Plastic Surgeons. In Pakistan there are at the moment 120 registered Plastic Surgeon who are member of the Pakistan Association of Plastic Surgeons. Out of which 35 are in the province of Sindh, 40 are in the province of Punjab, Twenty are in the Khyber Phutnkwa (NWFP) and five are in the province of Baluchistan.

The most important factors that determine the Burn prognosis are percentage of Burns, Depth of Burn, age of the patient, coexisting disease and element of inhalation injury. The main tissue that is destroyed in Burn injury is the skin, which is the largest organ of the body. Its loss causes both primary and secondary problems.

The mainstay of management of burn is that they have to be covered by autologous skin. During early periods of post-Burn injury this is not possible as there is paucity of donor site as well as patient is in precarious condition. The state of art treatment in developed countries is early tangential excision of the deep wounds once the patient is hemodynamically stable. This is followed by application of porcine skin or cadaveric skin obtained from tissue bank, or epithelial cultures obtained from Epithelial cultures Laboratory. This temporary coverage of wound put Patients into positive Nitrogen balance and patient withstand autografting in due courses of time.

In developing counties like India, Pakistan, Bangladesh, Sri Lanka, Egypt, Malaysia this is not possible. Porcine skin in Muslim world is impossible to think of due to religious grounds. Cadaveric skin also one can’t use due to cultural and religious grounds. Epithelial cultures are not yet available due to expensive and sophisticated technology plus they lack the firm dermal base.

Therefore in order to overcome this major deficiency of skin, a substitute like Amniotic Membrane seems to be the best option in this part of the world. Amniotic Membrane has been used since 1913 when Salbella first used in Burn case. In 1942 DeRoth used it as a replacement for conjunctiva. The role of Amniotic Membrane in management of Burns wound, chronic skin ulcers & lacerations, on split skin graft donor site, in Vaginoplasty, reconstruction of floor of mouth, as interposition vascular graft has been tried and beneficial effects were found. It has been used in various forms i.e. fresh, frozen and lyophilized freeze dried gamma radiated form.
Various studies have been conducted to show the difference in potency of freeze dried amniotic Membrane versus fresh Amniotic Membrane. Also studies were done about viability of cells with freeze drying. There is not much difference seen in the potency of fresh and freeze dried lyophilized amniotic membrane. (13) Cell viability of Amniotic Membrane decreases during storage. But this decrease in life of cells is minimal when Amniotic Membrane is stored at around four degree Centigrade.

Another method of prolonging the shelf life of Amniotic Membrane is to treat it with glutaraldehyde. Studies have shown this to be best method. (14) In county like Pakistan, with poor health resources, Amniotic Membrane is the best skin substitute that can be used in every Burn patient. Because of high birth rate it is easily and cheaply available. It's cleansing and preparation is convenient and can be taught to Operation Theatre technicians in a week time. Its storage is cheap and cost effective and can be used for prolonged period. (15)

Skin Bank for country like Pakistan are not practical solutions, Amnion Banks are! Skin Bank has porcine and cadaveric skin which will never be acceptable to population of Pakistan. All Plastic Surgeons of Pakistan must strive for the establishment of Amnion Bank and must use Amniotic Membrane for temporary skin coverage, especially in burn patients.

References:
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Special Topic
Guest Editorial by Patron History of Plastic Surgery in Pakistan

Professor Faiz Muhammad Khan
Department of Plastic Surgery, Jinnah Postgraduate Medical Centre, Karachi

SUMMARY. One of the more challenging problems in head and neck surgery is mandibular reconstruction. A variety of tissues and techniques have been used over the years in an effort to find a solution. Currently the majority of reputable centers centres around the world favour the free microvascular transfer of bone. The vascularised fibula is one of the most acceptable techniques, if not the most acceptable, for reconstruction of the mandible.

From October 1999 to March 2001 ten free fibula mandibular reconstructions were undertaken at the Aga Khan University. 9 Nine of these were carried out following tumour excision and 1 one after trauma. 9 Nine of these flaps were osseocutaneous and 1 one was osseous. There were 2 two flap losses while 8 eight flaps survived to give the patients a good cosmetic and functional result. While the numbers are too small to be of any real significance the early results would tend to justify this major surgery in certain well-defined situations.

Keywords: radial forearm flap, posterior interosseous flap, hand reconstruction

Plastic Surgery in Pakistan has existed in one form or another ever since its inception in 1947. General Surgeons and ENT Surgeons mainly practiced it all over the country. However, in 1964 Professor Durrani set up the First Nucleus of this specialty in Dow Medical College and Civil Hospital Karachi. Later in 1974 Professor Faiz Muhammad Khan set up a Unit at Jinnah Postgraduate Medical Center. These were the two main Plastic Surgery Units, which produced Plastic Surgeons in Pakistan.

The Department Of Plastic Surgery at Jinnah Postgraduate Medical Center was the first to be recognized by the College of Physicians & Surgeons, for FCPS in Plastic Surgery, and the University Of Karachi for MS Plastic Surgery. The Royal Colleges in the UK also recognized training in Plastic Surgery at Jinnah Postgraduate Medical Center (JPMC). Later the Department of Plastic Surgery at Dow Medical College was recognized for FCPS in Plastic Surgery by the College of Physicians and Surgeons, and for MS Plastic Surgery by the University of Karachi.

By this time other Plastic Surgeons returned to Pakistan who were trained abroad in addition to those trained at Dow Medical College and Jinnah Postgraduate Medical Center. Prominent among those who returned from abroad were Dr. Gool Talati, Professor Shaista Effendi Raisuddin, now head of the Department at Dow Medical College, and Dr. Fakhr Al Khairy who was Assistant Professor at Dow Medical College and later left his government appointment. Meanwhile, Professor Ghulam Ali Memon had left for Hyderabad after training with Professor Faiz for a short while at JPMC. The Punjab was joined by Dr. Hakimullah Babar, and Dr. Salim Malik.

Dr. Kaneez Fatima was the first to do her MS Plastic Surgery from Dow Medical College, and Dr. Nasir Zaman Khan was the first to obtain an MS in Plastic Surgery from JPMC, both from the University of Karachi. Dr. Ghulam Qadir Fayyaz and Dr. Muhammad Ashraf Ganatra had also acquired their MS in Plastic Surgery from Dow Medical College. By this time Dr. Abrar H. A. Khan and Dr. Tahir Sheikh had returned from the UK and Dr. Shahab Mehdi a little while later. At about the same time Dr. Atia Afaq Hussain had also completed her training at JPMC after she had acquired an FCPS in General Surgery as was the case with Dr. Najeeb Ansari, who had completed his training at Dow Medical College. The Specialty had now begun to flourish and was joined by many other able and qualified Plastic Surgeons, trained in Pakistan and from abroad.

At this point it is important to mention the Pakistan Association of Plastic Surgery, who was the first association of Plastic Surgery in the country. It was founded in 1994 with Dr. Faiz Muhammad Khan as the first President. The Association has been instrumental in promoting the specialty in Pakistan and has helped to establish it as a respected and respected specialty.

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of Plastic Surgeons was formed. The Founders were Professor Faiz Muhammad Khan (Founder President), Professor Shaista Effendi Raisuddin (Founder Vice President), Dr. Nasir Zaman Khan (Founder General Secretary), Dr. Ashraf Ganatra (Founder treasurer), Dr. Gool Talati, Dr. Kaneez Fatima and Dr. Atia Afique Hussain (Founder Members).

The Pakistan Association of Plastic Surgeons held its first international meeting in 1996, at Karachi. This historical meeting was attended by almost all the Plastic Surgeons in the country at the time, which included Dr. Professor Faiz Muhammad Khan, Professor Shaista Effendi Raisuddin, Dr. FakhrAl Khairy, Dr. Hakim Babar, Dr. Salim Malik, Dr. Abrar H. A. Khan, Dr. Nasir Zaman Khan, Dr. Atia Afique Husain, Dr. Gool Talati, Dr. Kaneez Fatima, Dr.Ashraf Ganatra, Dr. (Brig.) Amin, Dr. Tajjamal Choudhry, Dr. Tahir Shafi Khan, Dr. Najeeb Ansari, Dr. (Maj) Mamoon Rashid, Dr. Gulrez Rauf, Dr. Obaidullah, Dr. Moiz Sadiq and from the UK by Mr. Nicholas Breech.

Membership was floated at this time, and the meeting was a huge success. Since then the Association has held 6 successful annual meetings all over the country, this year being its 7th.

A journal for the Association was commissioned before the first meeting but could not be launched till now. This year is another historic moment in the history of the Association. The Pakistan Association of Plastic Surgeons now has close to fifty members. There are Units of Plastic Surgery in all four provinces of the country, and all major cities of Pakistan. It is my dream as well as a dream of those who struggled to promote the specialty in Pakistan, that the future brings with it massive progress in this specialty both in education as well as research. I wish the association, as well as the specialty, all the very best in the future.

Materials and Methods

This was a retrospective study of the first 10 consecutive mandibular reconstructions using vascularised fibula performed at the Aga Khan University in the 18-month period from October 1999 to March 2001. All 10 patients were operated upon after a thorough discussion of the pros and cons of the various options available and informed consent was obtained.

Preoperatively the patients were examined to confirm the absence of calf claudication and the presence of distal foot pulses. No non-invasive vascular studies or angiograms were performed in any of the patients.

All the patients were operated upon using a multidisciplinary approach. The ablative surgery was performed by the ENT team of surgeons and, once the defect size had been determined, the fibula harvest was performed synchronously. Rigid miniplate fixation was used to fix the fibula in position after one or more osteotomies. End to end vessel anastomosis was performed in each case using 8/0 prolene; only one venous anastomosis was used in each case. The flaps were monitored using clinical examination alone, supplemented in the single osseous flap with Doppler studies. Anticoagulation was not part of the postoperative protocol.

Results

There were 10 ten patients. Nine of the reconstructions were following tumour ablation and one following trauma. Of the 9 nine tumours seven were squamous cell cancers, 1 one was a recurrent salivary gland tumour and 1 one was a primary sarcoma of the mandible. The sole trauma patient had sustained blunt trauma many years prior to presentation.

The age range was 16 to 58 years with a mean of 42 years. There were 9 nine males and one female; the latter being the patient with a recurrent salivary gland tumour.

According to the HCL classification of Jewer there were 5 five ‘L’ defects, 2 two ‘LC’ defects, 1 one ‘C’ defect, 1 one ‘H’ defect and 1 one ‘HCL’ defect.

The composition of the flap was osseocutaneous in 9 nine of the patients and osseous in 1 one patient.

The total operating time ranged from 9.5 to 11 hours with a mean of 10 hours. The ischemia
time ranged from 2 to 6 hours with a mean of 3 hours. In the initial few patients the osteotomies were performed on the fibula once it had been detached from the leg. This led to an increased ischemia time, which was reduced once the operative technique was modified to allow osteotomies with the flap still perfused in the leg. The inpatient stay ranged from 5 to 28 days with a mean of 10 days.

There were 2 two complete flap losses while 8 eight flaps survived completely. One of the flap losses was put down to venous thrombosis secondary to haematoma formation while the other occurred in the buried osseous flap and was not confirmed till re-operation for infection 7 days postoperatively. The latter was salvaged with debridement and a pectoral myocutaneous flap while the former patient refused further operation at AKU and went elsewhere for treatment. Out of the 9 nine tumour patients 4 four had had previous radiotherapy and all 4 four had recurrent disease.

Besides flap loss other complications included 1 one common peroneal nerve injury, 1 one myocardial infarction and one wound infection at the donor site.

The conventional argument that such major surgery is not justified in elderly, debilitated patients, often with advanced disease, no longer holds true. In most cases of head and neck cancer morbidity and mortality are produced by local extension and invasion rather than distant metastasis. Thus, local control, by surgery and/or radiation therapy, is the sine qua non of successful therapy (Gurtner 2000) (8).

The trend today is to obliterate the disease, obtain local control and then provide the most functional result possible so that the quality of remaining life is as good as possible (Netscher 2000) (9). This often translates into usage of a free flap and sometimes can lead to the use of a second or even third free flap, in sequence, in the same patient (Demirkan 1999) (10). It is pertinent to point out that despite all efforts the overall survival for head and neck malignancies has remained static for the last 30 31 years (Blair 1994) (11).

References

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4. 5.

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7. 8.

Discussion

At the outset it is important to understand that no one flap can provide the ideal solution in all clinical situations. However as the free fibula flap has evolved from its early description by Taylor (2) and been recruited for mandibular reconstruction by Hidalgo (3) it has gradually become accepted as the one donor site best able to meet the demands of mandibular reconstruction. The fibula is especially suited for anterior defects or bilateral angle to angle defects to prevent collapse of the mandibular arch. The skin paddle is now accepted as reliable and in fact two independent skin paddles based on the peroneal vessels have also been described (Yang 2000) (4).

The best centers in the world quote free flap success rates in excess of 90 to 95 % though they are somewhat lower for free flaps containing bone (Kroll 1996) (5). Previous irradiation is associated with an increased flap failure rate (Khoury 1998) (6) and an increased risk of complications (Singh 1999) (7).


INSTRUCTION TO AUTHORS

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 manuscript to help the editors decide, how to deal with the matter.

Authors can submit their articles by post or by E-mail: mughese@yahoo.com to the Managing Editor, Pakistan Journal of Plastic Surgery. Article can also be submitted by post or by hand on a Compact Disc (CD) with three hard copies (laser copies or inkjet, photocopies are not accepted). Articles submitted by E-mail do not require any hard copy or CD.

General archival and linguistic instructions.

The author 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 E-mail 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 illustrations 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.

Material for Publication.

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