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UTILITY OF CONTRALATERAL SUPRACLAVICULAR ISLAND FLAP IN COVERAGE OF CLAVICULAR SOFT TISSUE DEFECTS: CASE REPORT
M. Busang, MBChB, MMed, Plastic, Reconstructive and Aesthetic Surgery Resident, Department of Surgery, University of Nairobi Medical School, Nairobi, Kenya **B. Rodrique,** General Surgery Resident, **L. N. Kakuko,** Urology Resident, Department of Surgery, University of Nairobi Medical School, Nairobi, Kenya, **N. W. Muciri,** MBChB, Resident, Plastic, Reconstructive and Aesthetic Surgery, Department of Surgery, University of Nairobi Medical School, Nairobi, Kenya **F. Wanjiru,** MBChB, MMed, Consultant, Plastic Reconstructive Surgery Unit, Kenyatta National Hospital, Nairobi, Kenya and **B. Wabwire,** MBChB, MMed, Senior Medical Specialist, Plastic and Reconstructive Surgery, Kenyatta National Hospital, Nairobi, Kenya

Correspondinf author: Dr Magdeline Busang, Department of Plastic Reconstructive and Aesthetic Surgery, University of Nairobi, Nairobi, Kenya, Email: busangmagdeline@gmail.com

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M. BUSANG, B. RODRIQUE, L. N. KAKUKO, N. W. MUCIRI, F. WANJIRU and B. WABWIRE

SUMMARY

Clavicular soft tissue defects present a significant reconstructive challenge especially when the bone or neurovascular structures are exposed due to scarcity of local tissue. The supraclavicular flap is a well-established flap in reconstruction of head and neck defects. However, literature about its use in closure of clavicular soft tissue defect is limited. Additionally, the role of contralateral supraclavicular artery flap in such reconstructions has not been well described.

This report presents a case of a 45-year-old man who sustained right clavicular soft tissue defect following road crash injury with medial third of the clavicle exposed. Tissue defect coverage was achieved using a contralateral island supraclavicular artery flap. No complications relating to either the flap inset or donor site were encountered post operatively..

This case demonstrates that the contralateral supraclavicular artery flap is an effective yet underutilized option in closure of clavicular soft tissue defects, and deserves a greater consideration in the reconstructive algorithm for such defects.

INTRODUCTION

Clavicular and supraclavicular soft tissue defects occur due to different etiologies including trauma, infections and post oncologic resections. Some of these defects are complicated by concomitant fractures and / or exposure of bone and neurovascular structures. , This makes reconstruction of this area a bit challenging due to limited local tissue availability and especially if the wound bed is not suitable for skin graft (1). Commonly used options include pectoralis major and latissimus dorsi myocutenous flaps. However, the latter flap is often too bulky and results in shoulder-clavicular contour deformity (1–3).Pectoralis minor has also been described for cover of the clavicular defect but limited to smaller defects, the other flap that is sometimes commonly used is the trapezius myocutenous flap but it is associated with donor site morbidity including shoulder weakness and higher risk of spinal accessory nerve injury(1). The ipsilateral supraclavicular flap in most circumstances is within the territory of the defect.

The supraclavicular flap is based on the supraclavicular artery, a direct cutaneous branch of the transverse cervical artery (and rarely the suprascapular artery). It provides a desirable option for clavicular soft issue defect coverage because of its thinness, reliable anatomy, pliability and good aesthetic outcomes. The ipsilateral supraclavicular artery flap is often within the territory of the injury rendering it unreliable for such reconstruction. This makes the contralateral flap a good option to consider for coverage of clavicular defects in cases where alternative local options are limited. Its use however remains underreported despite its potential usefulness (4,5). Figure-1 show an illustration diagram of the supraclavicular flap anatomy (6)

CASE PRESENTATION

A 45year old male presented with a day history of being involved in a road traffic crash in which he sustained degloving injury to the right forearm, arm and upper chest around the pectoral area, including degloving injury to the clavicular area with the medial third of the clavicle exposed and periosteal stripping, figure-2. Neurovascular examination of the right upper limb revealed intact circulation and normal

neurological function. There was limited abduction due to pain. No other injuries were found on systemic examination and review. Radiological investigations revealed no fractures, negative FAST and normal blood workups.

After serial debridement residual defect over the medial third clavicle measuring 7.3cm X 3 cm with bone exposed remained, precluding primary closure or skin graft. The ipsilateral supraclavicular artery flap was deemed an unsuitable option due to extensive contusion and active wounds over the deltoid and anterior chest.

A decision was reached to cover the defect with a contralateral supraclavicular artery flap. With the patient under general anesthesia, the left supraclavicular artery was identified with a handheld doppler, a fasciocutaneous supraclavicular flap was designed on the left side, about 5.5 cm above the insertion of the deltoid employing the reverse flap planning technique figure-3. The flap was elevated in a subfascial plane, with the pedicle visualized above the fascia. Following adequate mobilization, the proximal part of the flap was de-epithelized leaving the distal part set for inset intact figure-4. Perfusion at the tip of the flap was assessed by minimal excision of the distal flap with bleeding from the tip was confirmed, figure-5. A tunnel was created and kept broad to prevent pedicle compression. The flap was tunneled across the midline to cover the right clavicular defect without any tension, and the donor site was closed primarily as demonstrated in figure-6. The rest of the wounds were closed with a split thickness skin graft. The flap demonstrated good perfusion and no signs of congestion intraoperatively, figure- 6.

Figure 1: Illustration diagram of supraclavicular flap anatomy

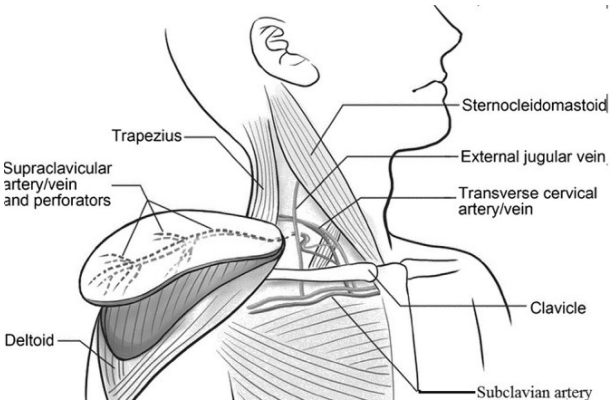

Figure 2: Pre-operative image.

Figure 3: Left supraclavicular artery flap markings (SCM; sternocleidomastoid muscle, EJV ;external jugular vein, SCA ; supraclavicular artery.)

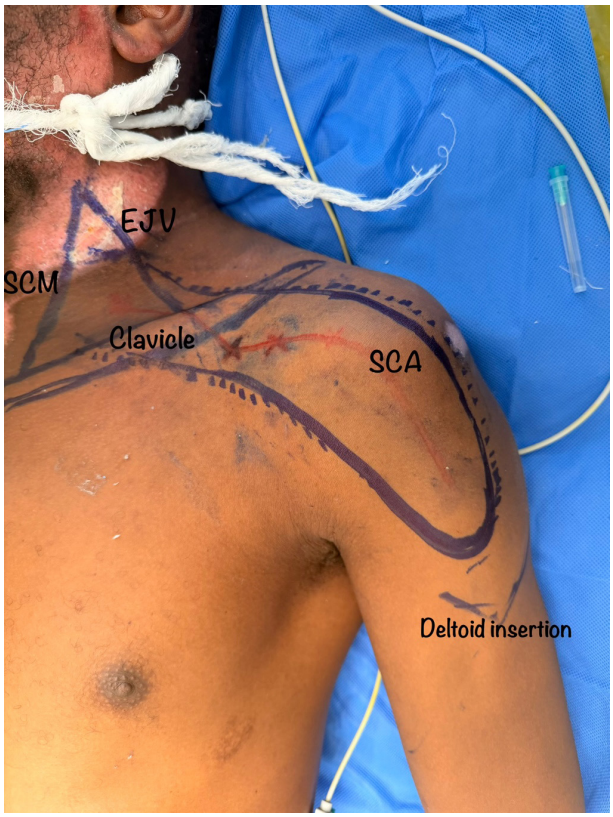

Figure 4: Deepithelialized proximal part of the flap

Post operatively the flap remained well vascularized with no signs of congestion or dehiscence. The other wounds healed completely and no flap complications were experienced. All stitches were removed on day seven. At two months follow up, the patient showed a stable wound coverage, satisfactory contour, acceptable cosmetic outcome with no shoulder functional limitation figure-6 & 7.

Figure 5: Demonstrating the viability of the distal part of the flap after cutting a small part of the flap tip.

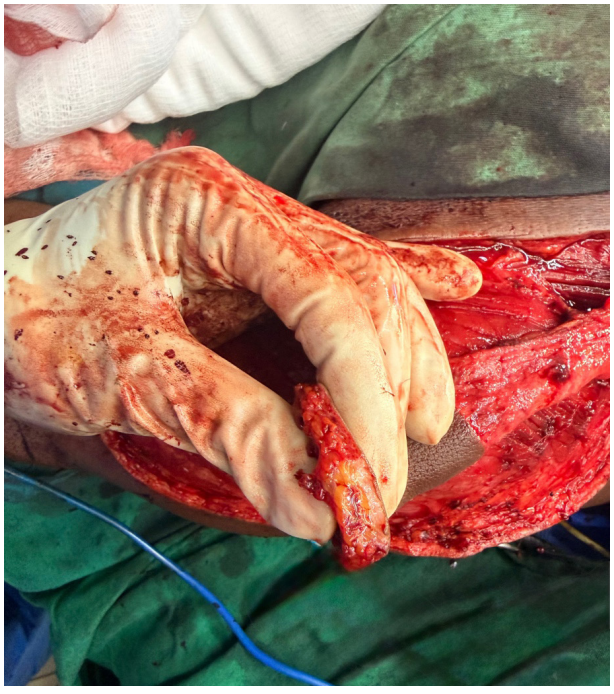

Figure 6: Showing flap inserted with no tension, donor site closed primarily

Figure 7: 2-month post-operatively, flap and graft well taken.

DISCUSSION

The supraclavicular artery flap is a well-established reconstructive option in head and neck surgery, with extensive literature supporting its use in defects of the oral cavity, neck, pharynx and upper chest, owing to its

consistent vascular anatomy, good colour match, thin and pliable tissues and minimal donor site morbidity as the donor site can be closed primary. The flap is amenable to pre-expansion for regional coverage of head and neck defects when a long pedicle is desired, or for free flap reconstruction (4,7).

The application of the supraclavicular artery flap for clavicular defects remains underreported in literature. Reconstruction of clavicular soft tissue defects pose challenges compared to other head and neck defects due to frequent exposure of the clavicle, high mobility and increased mechanical stress. The use of bulkier flaps such as pectoralis major, latissimus dorsi and trapezius myocutenous flaps, and even free tissue transfer in covering such defects is associated with unfavourable clavicular contour appearance, donor site morbidity not withstanding (1).

The available literature suggests that the supraclavicular artery flap offers durability, pliability, long pedicle and good colour match for head and neck which are qualities desirable for clavicular defects. This flap is also less bulky compared to other local or regional flaps which is advantageous for conserving the clavicular contour (8) (9).

Review of available studies revealed no published cases specifically relating to the use of contralateral supraclavicular artery flap for reconstruction of clavicular defects. Lack of documented cases may be related to concerns regarding the potential vascular compromise which usually present with distal tip necrosis and arc of rotation when crossing the midline (10)(11). With adherence to surface landmarks, doppler confirmation of the pedicle, adherence to anatomical planes during flap dissection and creation of an adequate tunnel. this case demonstrated that these fears may be unfounded as none of the often-mentioned complications was encountered (figure 5-7).

In the present case, the contralateral supraclavicular flap provided a sufficient reach of contralateral mid clavicular region without any tension because of its long pedicle(figure-4). It provided reliable cover of the contralateral clavicular defect where ipsilateral local or regional tissues were unsuitable. The flap offered a stable coverage of the bone without compromising clavicular mobility, clavicular contour nor donor side morbidity..

This case demonstrates that the contralateral supraclavicular flap is a valuable reconstructive option in selected cases especially in trauma patients with extensive local tissue damage. The contralateral supraclavicular artery flap represents a simple, easy to learn and reliable, yet underutilised option for clavicular soft tissue defect reconstruction. The flap deserves greater consideration in the reconstructive algorithm of clavicular soft tissue defects, providing additional useful armamentarium for the reconstruction surgeon to existing options.

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