

CATERPILLAR ADVANCEMENT FOR PARTIALLY NECROSED DELTOPECTORAL FLAPAnand Narayan Gautam¹, Vicky Khobragade², Sanjeev Kumar³**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: Development of electric lamp by Thomas Elva Edison had significant impact on human civilization. With increasing production of electrical energy to meet ongoing demands of increased frequency of electrical injuries. Despite increased awareness of potential dangers, electricity is responsible for many fatalities all over the world. Electrical burn accounts for ~3% of all burn related injuries. Estimated 3, 000 annual admissions to burn units. Electrical burn have bimodal distribution ~1/3 children <6 yrs (Electric cords & wall outlets) ~2/3 miners, construction, & electrical workers. Our case is one that of a 12 year old male child having electrical injury over face and neck with exposed angle of mandible which was covered by Deltopectoral flap with caterpillar advancement of flap.

KEYWORDS: Electrical burn, Flap Necrosis, Flap Divison, Deltopectoral flap with caterpillar advancement.

INTRODUCTION: Deltopectoral flap is a fasciocutaneous type of flap. Standard Flap size of 10 X20 cm and Delayed flap size of 10 X 27cm. Sensory nerve supply is from second to fourth intercostal nerve. Dominant pedicle of flap is largely based on first, second and perforating branches of internal mammary artery. Standard flap will reach neck, lower face and oral cavity but delayed flap has a longer reach and may be folded for intra-oral reconstruction or for an extended arc of rotation to the midface. For standard flap, it is located b/w sternum and anterior axillary line and extends from clavicle to 4th or 5th IC space. For extended flap, it is extended over deltoid muscle. A preliminary flap delay is required to extend flap length. The donor site is rather obvious and almost always requires a skin graft for closure.

CASE HISTORY: A 12 year old boy presented with the defect over right angle of mandible [Figure 1]. He had history of accidental high voltage electric burn injury, while he was marching for 26th January 2014 (Republic day). He was holding the iron pole hoisting our national flag in his hand, and suddenly the upper end of the pole touched high tension electrical line which lead to burn injury over right side of face, neck, bilateral upper limb, lower limb and exit wound over right sole. Subsequently he was treated at primary health care Centre, near his village, later on he developed defect over right angle of mandible, for which he came to our hospital.

On examination a 3x3 cm defect with exposed angle of mandible is seen. So we planned the coverage of defect with deltopectoral flap along with remaining post burn raw area over right upper and lower limb with split thickness grafting.

Deltopectoral flap was done on 21st February. Till 7th post-operative day the flap was healthy but from 8th post-operative day the blackening of the upper part of the flap was started and almost 50 % of upper half of flap was necrosed.

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We continued the conservative management and slightly delayed the flap division. The flap division was done at around 32nd post-operative day with slight modification known as CATERPILLAR ADVANCEMENT was done [Figure 2], In which the free divided part of the flap is transposed to the necrosed part of the flap after the debridement of necrosed part of the flap. Method was worked and flap was healthy at the time of discharge and during the follow-up period [Figure 3].

DISCUSSION: This type of patient presents a significant challenge to the reconstructive surgeon, but also highlights one of the rewards of the field – the ability to choose among many available reconstructive options. As evidence of the wide range of possibilities, the latest edition of Grabb's Encyclopedia of Flaps lists 50 different options for neck and cheek reconstruction.

Among those is the deltopectoral flap, a versatile flap with many potential benefits and few drawbacks when used appropriately. The deltopectoral flap originated in the beginning of the 20th century. Although the modern implementation is attributed to Bakamjian,^[1] the first description was reported by Aymard in 1917, a contemporary of and sometimes rival to Gillies. The deltopectoral flap is a parasternal, axial fasciocutaneous flap based on the perforators of the internal mammary artery. At its fullest extent, it can reach practically all of the lower two-thirds of the face. This flap has been used for nasal reconstruction pharyngoesophageal reconstruction, fistula closure, tracheal reconstruction, full-thickness vascularized skin repair, as cover for critical head and neck structures, and as cover for other flaps. Use of the deltopectoral flap as a free fasciocutaneous flap has been reported.^[2]

The deltopectoral flap is particularly useful in patients requiring coverage of the anterior or lateral neck, and provides an excellent match for colour, texture, thickness and hair-bearing to facial skin. When compared with the pectoralis major myocutaneous flap, the deltopectoral flap has little or no effect on shoulder function. Finally, the deltopectoral flap can be elevated and transposed without repositioning the patient, allowing the donor and recipient sites to be prepared simultaneously.^[3] The deltopectoral flap often requires multiple surgeries to achieve optimum results. Many authors have reported flap success rates in the range of 75% to 90%, with failures typically including distal flap necrosis.^[4]

With meticulous flap handling and careful attention to the fascial plane during dissection, the deltopectoral flap has the potential for rates of success of 90% to 95%.

Feng et al^[5] reported 34 cases using the extended deltopectoral flap with no flap loss, and in which only two cases required local advancement of skin or skin grafting to complete the closure, yielding a success rate of >94%. The present case demonstrated the utility and versatility of the deltopectoral flap in reconstructing the angle of mandible beyond salvage.

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Fig. 1: Preoperative Defect



Fig. 2: Immediate Postoperative



Fig. 3: 8th Postoperative Partial Blackening of Flap Upper Part



Fig. 4: After Flap Division Upper Part of Flap Necrosed



Fig. 5: 2ND Postoperative Day After Flap Division & Inset



Fig. 6: Sixteenth Postoperative Day

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