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Role of Hybrid Reconstruction Ladder in Electric Burns of Scalp

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ABSTRACT

The role of hybrid reconstruction ladderin the treatment of burn wounds has been widely used owing to its role in improving the outcome in terms of wound bed preparation and post trauma scarring. Here, in our study, we are evaluating the efficacy of use ofhybrid reconstruction ladder in the electric burns of scalp.

Keyword: Hybrid Reconstruction Ladder; Electric Burns; Scalp.

INTRODUCTION

Burns are among the most devastating of all injuries, with the spectrum of outcomes spanning from physical impairments and disabilities to emotional and mental consequences.[1] Majority of burns are caused by thermal energy including scalding and fires, and minority being caused by exposure to chemicals, electricity, ultraviolet radiation, and ionising radiation. Globally, fire related burns are responsible for about 265,000 deaths annually.[1] Over 90% of fatal fire related burns occur in developing or low and middle income countries (LMICs) with South-East Asia alone accounting for over half of these fire related deaths.[1]

Involvement of scalp in electric burns is around 3-5%. There are challenges in managing the scalp burns in case of electrical burns with regard to need for split thickness skin graft or flap, choice of flap, reconstruction method to be adopted. It poses a special problem in the form of inelastic nature of scalp and also hairy nature of the scalp. Exposure of the calvarium necessitates the requirement of a vascularised flap. With proper choice of management, various complications can be prevented along with disfigurement.

Evidence for hybrid reconstruction ladder in electric burns of scalp in terms of its effectiveness and the process by which it helps in faster healing of the wound is inadequate. Aim of this study is to evaluate the effectiveness of hybrid reconstruction ladder in electric burns of scalp.

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MATERIALS AND METHODS

This study was conducted in tertiary care centre in department of plastic surgery after getting the department ethical committee approval. Informed consent was obtained for examination and clinical photography. The subject was 13 years old female with history of thermal burns due to contact with the low voltage electric tower with sustained injury to the forehead, scalp (fig. 1), left big toe, right little toe. 5% burns on forehead with involvement of bilateral eyes and face and bilateral lower limbs. She was taken to near by hospital and treated with

analgesics and antibiotics. Then she was brought, and was treated here. Patient underwent regular dressing along with APRP (autologous platelet rich plasma) application (Fig. 2), with hydrojet debridement (Fig. 3), with serial dressings with vitamin D3 and Sucralfate therapy to scalp (Fig. 4) and serial NPWT (negative pressure wound therapy) was also applied (Fig. 5), later ER yag laser was given to scalp and other healed areas (Fig. 6). The wound site healed eventually (Fig. 7).

Fig. 1: Electric burns involving face and scalp

Fig. 2: APRP application

Fig. 3: Hydrojet debridement

Fig. 4: Vitamin D3 & Sucralfate application

Fig. 7: At the time of discharge

Fig. 5: Post NPWT application

Fig. 6: ERYAG laser to healed area

RESULTS

After application of serial dressings with serial application of vitamin D3 and sucralfate therapy to the scalp , in our study, we were able to reduce time taken for healing of burns area and good take of graft . Use of hybrid reconstruction ladderhelped in the wound bed preparation and aided early skin grafting and wound healing.

DISCUSSION

Burn injuries are very common and afflict approximately 1% of the population yearly. They are a source of heavy medical burden to medical systems worldwide. Morbidity and mortality are decided by factors like: total body surface area (TBSA) involved, the anatomical location, depth of burn,, the age of the subject, prior medical history involvement of other systems (especially airway injury).[2]

An electrical burn is a skin burn that happens when electricity comes in contact with your body. When electricity comes in contact with your body, it can travel through your body. When this happens, the electricity can damage tissues and organs. This damage can be mild or severe and it can even cause death. The organs that are commonly damaged are

heart, kidneys, bones, muscles and nervous system. The symptoms depend on how much electricity comes in contact with your body and how long the contact lasted. Electrical injuries can be caused by exposure to current from low voltage and high voltage sources as well as lightning strikes, and the circumstances of the exposure will dictate management strategies. Human tissues have varying resistance characteristics and susceptibility to damage, so injuries may be thermal, electrical, and or mechanical, potentially causing burns, thrombosis, tetany, falls and blast injury. Electricity can cause superficial burns, partial thickness and full thickness burns. Like many things in medicine, a team approach is best in complete management of a patient with an electrical burn.[3] There should be open and clear communication between providers regarding wound care from nursing or technicians involved in patient care, airway from respiratory therapy, sedation and analgesia, consultants such as a general surgeon or plastic surgeon, and the primary provider /team caring for the patient.

CONCLUSION

We have found that hybrid reconstruction ladder has been very useful in management of thermal wounds especially in electric burns of scalp, but requires large scale randomised trials for large scale application to explore the potential of the same in electric burns.

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