

Management of Circumferential Skin Loss in Lower Limb, Above Knee Amputee Using “Altaf Technique”

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SUMMARY

A young boy got a run over injury in a road traffic accident, resulting into an open fracture of the tibia with loss of soft tissue extending up to the upper part of the thigh. After few days he developed an ischemic gangrene of right tibia that ended into above knee amputation. The skin of the thigh was excised at a much higher level. Thus a circumferential skin loss of about 15-16 cm length was created. This circumferential skin loss was treated with lengthening of the skin by this new technique “Altaf technique”.

Keywords: Circumferential skin loss, Altaf technique, amputation, stump, skin elongation, gangrene, SSG, open fractures

INTRODUCTION

Circumferential skin loss is usually associated with open fractures of limbs in high velocity injuries. Certain crush injuries leading to amputations may be associated with much more loss of skin. In past, such amputations with circumferential skin loss have been managed either by cutting the stump shorter or applying a split skin graft. Both options are associated with many disadvantages and complications. Cutting the stump shorter leads to difficulty in prosthesis fitting and a heavier and bigger prosthesis, that causes more energy expenditure. Split skin grafts have been associated with recurrent ulcerations and wounds. Such SSG are also insensate. There has been a need to have a normal, full thickness and sensate skin which can bear weight in prosthesis and avoid complications. In literature, there are reports showing slow lengthening of skin can be done using thick nylon interlacing sutures or a skin stretching device to bring the wound edges closer^{1,2}. Ilizarov' Technique of skin elongation in distraction osteogenesis has been well known in orthopedic surgery³. Thus on the bases of the concept of skin elongation as described in literature; we have developed a new technique that can be applied on the amputated limbs for the management of circumferential skin loss. Here is a case report with this new technique.

CASE REPORT

History: A 22-year old male student presented in Accident & Emergency with history of run over injury in a road traffic accident.

Physical findings: There was a crush injury to right lower limb extending from knee to ankle.

Distal pulses were not palpable. Bone was exposed. Skin was avulsed and muscles non reactive. X-rays showed a comminuted fracture of tibia and fibula with missing fragments. Mess scoring was 7.

Operative procedure 1: An above knee amputation was performed in Accident & Emergency department and wound left open.

Operative procedure 2: Few days after the skin in thigh region was found to be necrotic hence excised. Finally a circumferential skin loss varying from 10 to 15 cm with underlying viable granulation was created much higher than stump. We planned for lengthening the skin from the distal edges of remaining skin.

Technique for skin lengthening: At the margins of skin a circumferential K wire was passed about 5mm from margins for strengthening of margins. Then longitudinal wires (circulage) were looped over K wire at a distance of one centimeter. These k wires were attached to a ring in front of stump. This ring was anchored in front of the stump by two threaded rods. These rods were attached to limb with two Schanz screws. The ring was distracted @ 4 mm/day at equal four intervals of 1 mm. these pulling wires were kept parallel to underlying tissue, not to apart. At the end of the procedure skin margins became necrotic and were excised. By the time the skin was so much elongated that closure was possible.

DISCUSSION

The ideal method to treat a skin defect is replacement with the patient's own normal sensate skin. This can be achieved by lengthening patient's own skin. Lengthening of skin along with bone and soft tissues, is regularly practiced in orthopaedic surgery utilizing the Ilizarov method, which is based on the principle of tissue growth under tension^{3,4,5,6}. Many skin stretching devices and techniques have been described in literature^{1,2}. Here we have utilized a combination of these two approaches whereby skin was lengthened gradually in a controlled fashion to treat circumferential skin loss. Two wires were found to be pulled out but these were not revised. Thus we were able to make a normal, full thickness, sensate skin.

The limitations of this technique are pulling out of wires if lengthening was prolonged or done too fast. We have no experience of applying this one on a scarred or compromised skin.

During this period patient was mobile on crutches and was not bed ridden. We are hopeful this technique would

be useful in selected cases of circumferential skin loss, in areas lower limb amputations where split skin grafts are unstable due to repetitive frictional trauma caused by prosthesis; a new technique to apply it on the amputated limbs for the management of circumferential skin loss. Here is a case report with this new technique.

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