

Scalp Wound Closure with K wires: An alternative easier method to scalp wound closure

Ramesh Sasidaran, MS, Serjius Ajik, MS

Plastic Reconstructive Surgery Unit, Hospital Queen Elizabeth, Kota Kinabalu, Sabah

SUMMARY

Scalp defects and lacerations present a reconstructive challenge to plastic surgeons. Many methods have been described from the use of skin grafting to rotation flaps. Here we present a method of closure of a contaminated scalp wound with the use of Kirschner wires.

In our case, closure of scalp laceration was made possible with the use of 1.4 Kirschner wires and cable tie/ zip tie fasteners. The duration to closure of wound was 10 days. In reconstructing the scalp defect, this method was found to adhere to principles of scalp reconstruction. There were no post operative complications found from the procedure. On initial application on the edge of the wound, tension applied caused the K wires to cut through the wound edge. On replacement of K wires 1cm away from wound edge the procedure was not plagued by any further complication. In conclusion we find scalp closure with Kirschner wires are a simple and effective method for scalp wound closure.

KEY WORDS:

Scalp reconstruction, Tissue expansion, K wire

INTRODUCTION

The closure of scalp wounds has been an ongoing challenge to the plastic and reconstructive surgeon. There are many surgical methods of management of scalp reconstruction described in literature from primary closure to a free flap closure depending on the size of defect. We describe a simple method of closure of a scalp defect with the use of a pair of K wires and cable fasteners.

CASE REPORT

A 30yr old male was seen in casualty with a laceration of the scalp area secondary to alleged motor-vehicle accident. On examination the laceration measured 10cmx 3cm exposing 2cmx2cm region of the cranium. The wound was found to be contaminated with dirt and debris. Debridement of the scalp wound was done under local anesthesia at the casualty with copious irrigation of saline. Intravenous broad spectrum antibiotics were instituted. As the operating theatre was closed for renovation, an alternative method of closure was designed with materials that were present in the hospital. We were able to suture the wound in a period of 10days.

MATERIALS AND METHOD

After infiltration of the wound edges with local anaesthesia, the edges were skewered with a size 1.4 K wire (Figure 1). A

zip tie or cable fastener was soaked in povidone prior to use. The fasteners were placed in between the skewered K wires and fastened in place. Dressing of the contaminated wound was done daily with povidone and subsequently dressed with jelonet, hydrocolloid gel and saline gauze. Dressing was done daily. This allowed us to inspect the wound daily in case of inflammation or infection. The fasteners were tightened daily until the wound edges were approximated to allow closure with sutures (Figure 2 & 3).

DISCUSSION

The various methods of scalp reconstruction have already been mentioned elsewhere whereby adherence to the steps in the reconstructive ladder is ideal¹. The simplest method is to skin graft the defect when a viable bed is present to receive the graft. Otherwise a pericranial flap may need to be designed for the adjacent area. Another option is that the skull may need to be burred down to the diploe. More complicated methods of closure involve the usage of negative pressure wound therapy. Pericranial flaps have an unpredictable vascularity, being an axial pattern flap only for the first 6cm from the origins of the supratrochlear and supraorbital vessels². Cranial burring may require further application of negative pressure wound therapy to allow for sufficient granulation to allow for skin grafting. This may take an extended period of time to achieve.

More complicated methods of reconstruction are tissue expansion and local tissue transfers. Tissue expansion requires several admissions, for the insertion and for the removal of the implant³. It also requires multiple visits to the clinic for gradual expansion of the implant. The process can be having its own set of complications. Furthermore, the grotesque appearance of the individual forces them to shy away from public appearances and impels them to wear comical head-gear to conceal the expanding implant. Local tissue transfers although reliable, requires that an appropriate design be planned prior to surgery. The surgeon should also take into consideration the preservation of blood supply and nerve supply to the design, while also preserving a back up plan or flap should there be a complication. Preservation of the hairline may also be a hindrance to flap coverage. The option for local tissue transfer becomes limited in males with a receding hairline. Besides that, direction of hair growth also needs to be considered when rearranging the scalp in a local tissue transfer. Scalp flap elevation also requires general anesthesia and exposes the patient to significant blood loss which maybe deleterious in an elderly individual with associated co-morbidities.

This article was accepted: 7 November 2012

*Corresponding Author: Ramesh Sasidaran, Plastic Reconstructive Surgery Unit, Hospital Queen Elizabeth, Kota Kinabalu, Sabah
Email: ruffryder28@hotmail.com*

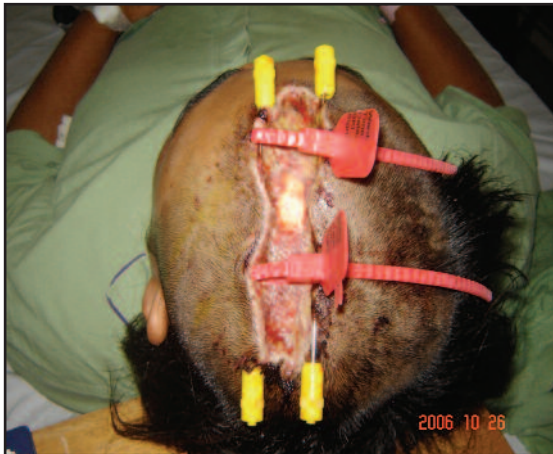


Fig. 1: K wire and nylon cord in place.



Fig. 2: Day 9 post insertion of K wires.



Fig. 3: Day 10 complete closure of scalp defect.

Finally, free tissue transfers although elegant, is time consuming, requires special expertise and special equipment and trained staff. The scalp defect in our patient was not significantly large and we were driven to consider an alternative method of reconstruction. It does however seem that this method of skin stretching adhered to all the goals of

scalp reconstruction, while preserving other options for reconstruction and conserving the hairline. There was no need for a scalp drain and no need for blood transfusion. Finally the patient tolerated the procedure well and was pleased with the results.

This procedure can be applied to all areas of the scalp as it involves tissue expansion. The more mobile areas of the scalp (i.e temporal, lower occipital) will take less time to achieve closure compared to less mobile areas (i.e parietal, frontal). The procedure is recommended for acute wounds on the scalp which do not expose vital structures (i.e brain tissue) . It is contraindicated in patients who are unwilling to tolerate the repeat stretching procedure and wish for a single procedure disregarding the final cosmetic appearance. It is also contraindicated in wounds with poor vascularity (e.g post radiotherapy) and in mentally unstable patients.

REFERENCES

1. Patrick C. Angelos, Brian W. Downs; Options for the Management of Forehead and Scalp Defects, *Facial Plast Surg Clin N Am* 2009, 17; 379-93.
2. Yoshioka N, Rhoton AL Jr; Vascular anatomy of the anteriorly based pericranial flap, *Neurosurgery* 2005, 57(Suppl 1); 11-6.
3. Hoffmann JF; Tissue expansion in the head and neck , *Facial Plast Surg Clin N Am* 2005, 13(2); 315-24.