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Colorado Needle Assisted Cross-Leg Flap

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Abstract

Lower limb injuries are most commonly due to road traffic accidents which cause lower limb defects. The management of lower limb fractures is guided by the Gustilo-Anderson classification of injuries. Simple leg defects are covered by localflap and complex defects by free flap. Complex defects of the lower limbs which were unfit for free flap require management by conventional cross leg flap. Colorado needle allows meticulous dissection of flaps due to the sharp tip and increases the efficiency in raising the flaps.

Keywords: Colorado needle; Cross-leg flap; Lower limb defects; Flap elevation.

INTRODUCTION

Lower limb injuries are more common in India due to increased incidence of road traffic accidents which further cause lower limb defects due to the soft tissue anatomy of the lower limb. The management of lower limb fractures is guided by the Gustilo-Anderson classification of injuries. The defects are close to restore the normal anatomy of the lower limb and improve the quality of life of the patient. Simple leg defects are covered by local flap and complex defects by free flap. The complex defects require more intense care and careful management by free flaps. The complex defects which is unfit for free flaps are managed by conventional cross leg flap. Colorado needle allows meticulous dissection of flaps due to the sharp tip which provides more precise micro dissection and increases the efficiency in raising the flaps.[1,2] In this case report, we highlight the role of Colorado needle in dissection of cross leg flap.

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MATERIALS AND METHODS

The study was conducted in the department of Plastic Surgery in a tertiary care hospital. Informed consent was obtained from the patient after explaining the nature of the study. The study is a non randomised prospective study. The patient was a 57-year-old male, with no known co-morbidities. He was admitted following Road traffic accident involving right lower limb with degloving injury of the skin, exposure of the muscle and bone. Soft

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tissue and bone with periosteal stripping of parts of tibia and loss of middle one third of tibia with the raw area extending from just below the knee joint to the ankle region. Patient was initially admitted in the orthopaedics department for fracture of mid segment of tibia. Wound debridement and external fixation was done followed by regular dressing and wound care. Patient was referred to plastic surgery for wound management and flap cover. Initially wound bed was prepared with regenerative therapies like low level laser therapy, autologous platelet rich plasma, Centenella extract, prolotherapy,collagen scaffold dressing and cyclical Negative Pressure Wound Therapy. After regenerative therapiesskin grafting was done. The graft uptake was well. Cross leg flap after maturation of graft site was done using Colorado needle for raising the flaps. (Fig 1, 2 and 3)The Colorado needle is available in various sizes with different angulation (N-series, E113-series, E103-series, E117-series, E1400-series)[3] and costs around 1500 Indian rupees.



Fig. 1. Marking of the Cross-leg flap



Fig. 2. Colorado assisted cross-leg flap



Fig. 3. Cross-leg flap

RESULTS

After meticulous flap dissectionwith Colorado needle cautery tip no complication noted in the post operative period. No flap loss or necrosisobserved after 5 days.

DISCUSSION

Incisional blood loss with Colorado needle isreportedly significantly less when compared to the steel scalpel incisions. Sheikh B reported approximately four times more blood loss with a steel scalpel when compared to the Colorado micro dissection needle for scalp incisions in neurosurgical procedures.[4,5] N Nitta et al. reported that, the blood loss was three to five time lesser using the micro needle electrocautery scalpel compared to cold steel (scalpel) for scalp incisions in neurosurgical procedures. The study reported by Kearns et al, incisional blood loss with electrosurgical incisions is reportedly significantly less when compared to the steel scalpel incisions. Milan et al study showed that almost all cases had less incisional blood loss with Colorado micro dissection needle, supported by a statistically significant result.[6,7]

Perkins J determined micro dissection needle for tonsillectomy resulted decreased postoperative pain when compared with standard electrocautery. In Milan et al study, as expected, the mean pain scores for both modalities decreased at each pain assessment after surgery. The mean pain scores for

Colorado micro dissection needle were less and P-value suggest statistically significant.[8,9]

One of the concerns regarding electrosurgery was the theoretical risk of increased wound complications due to the heat production which results in a zone of tissue necrosis adjacent to the incision. It was proven by several studies that electrosurgically created incisions showed less increased incidence of wound complications such as dehiscence and infection.[10]

According to Milan et al study, at 6 months follow up the level of the scar as compared with surrounding skin, color match, consistency and width were normal in all the cases. N Nitta et al. suggest use of Colorado micro dissection needle, results in minimal wound damage, minimal scarring, excellent healing and minimal alopecia as it works with minimal electric contact technique.It was noted that, a Colorado micro dissection needle gives less width and better scar than cold steel (Scalpel). [11,12]

There was significant less incisional blood loss intra operative and less pain post operatively compared with a cold steel (scalpel). There was no evidence of any scar tenderness or keloid formation in follow up of the cases and it was noted that, the width of post-operative scar when using Colorado micro dissection needle is lesser and better healing than cold steel (Scalpel). Also, the time taken for incision with Colorado micro dissection needle was lesser than cold steel, but it was statistically insignificant.

CONCLUSION

The Colorado micro dissection needle is both safe and useful in surgical procedures compared to other modalities.

REFERENCES

1. Kirkup J (1995) The history and evolution of surgical instruments- VI The surgical blade: from fingernail to ultrasound. Ann R CollSurgEngl 77: 380-388.
2. Bashetty K, Nadig Kapoor S (2009) Electrosurgery in aesthetic and restorative dentistry: A literature review and case reports. Jrnl Cons Dent 12(4): 139-146.
3. Hausner K (1986) Electrosurgery. Addison IL Elmed, Inc p. 2-10.
4. Sharma R (2017) Safety of Colorado microdissection needle (stryker) for skin opening in craniomaxillofacial surgery. J. Maxillofac. Oral Surg 11(1): 115–118.
5. Rideout B, Shaw G Y (2004) Tonsillectomy using the Colorado microdissection needle: A prospective series and comparative technique review. Southern Medical Journal 97(1): 11-17.
6. Farnworth T, Beals S, Manwaring K, Trepeta R (1993) Comparison of skin necrosis in rats by using a new microneedleelectrocautery, standardized electrocautery, and the Shaw hemostatic scalpel. Ann PlastSurg 31(2): 164-167.
7. Sheikh B (2015) Safety and efficacy of electrocautery scalpel utilization for skin opening in neurosurgery. Br J Neurosurg 18(3): 268-272.
8. Kearns S, Conolly E, Mcnally S, McNamara D, Deasy J (2001) Randomised clinical trial of diathermy versus scalpel incisions in midline laparotomy. Br J Surg 88: 41-44.
9. Madhukar KT, Ganesh MT (2016) Comparative study of safety and efficacy of electrocautery blade with cold scalpel blade for skin opening during fixation of fracture of forearm bone with plate and screws. International Journal of Health & Allied Sciences 1(3): 153-157.
10. Margarita Peneva, AndrijanaGjorgjeska, Vladimir Ginoski, HristinaBreshkovska, RozaDzolevaTolevska (2018) Electro- surgical microneedle versus scalpel skin incisions in the facial region. Sanamed 13(3): 1-8.
11. RampalliViswa Chandra, BoyaSavitharani, AileniAmarender Reddy (2016) Comparing the outcomes of incisions made by Colorado microdissection needle, electrosurgery tip, and surgical blade during periodontal surgery: A randomized controlled trial. J Indian SocPeriodontol 20: 612-622.
12. Yonca O Arat, Almila S Sezenoz, Francesco P Bernardini, Mark A Alford, MerihTepeoglu, et al. (2016) Comparison of Colorado Microdissection Needle Versus Scalpel Incision for Aesthetic Upper and Lower Eyelid Blepharoplasty. Ophthal Plast ReconstrSurg 13: 1-6.