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Reconstruction of soft tissue defect of the achilles tendon with islanded VY advancement flap

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Abstract

Background: Stable skin cover over exposed tendo achilles is essential for proper healing of tendo achilles to regain its normal function. Exposed tendo achilles can be a result of open injuries, repair of closed tendo achilles rupture, complications occurring after repair. Various methods have been described in literature for coverage of repaired tendo achilles for example distally based skin flaps, advancement flap, free tissue transfers and islanded flaps. This article describes the usefulness of islanded VY advancement flap for stable skin cover over tendo achilles.

Methods: A 34-year-old male had a injury over left TA region following trauma causing a raw area near its insertion. Preop and intra op doppler was done to locate and verify the position of the perforator.

Results: The flap survived and on follow up the tendo achilles had good function with stable, supple, healthy skin overlying the tendon. Tendoachilles strength was assessed by asking the patient to stand on toes.

Conclusions: Islanded VY Advancement flap cover over tendo achilles provides a stable, reliable, single stage procedure with good aesthetic appearance.

Keywords: VY advancement flaps, Tendo achilles cover, Islanded flap

Introduction

Stable skin cover over exposed tendo achilles is essential for proper healing of tendo achilles to regain its normal function. Exposed tendo achilles can be a result of open injuries, repair of closed tendoachilles rupture, complications occurring after repair. Tendo achilles injuries leading to disruption of the tendon is commonly seen in developing countries. The diagnosis of closed tendon rupture is made on clinical examination with positive Thompson test [1]. Open Tendo Achilles injury resulting in exposed tendoachilles may be associated with avulsion injury of the overlying skin. Such injuries are observed in individuals using Indian style lavatory pans and accidental slipping in the toilet [2]. Management of tendo achilles injuries usually involves two aspects. First being the repair or reconstruction of the ruptured tendo achilles. Second being the management of the skin overlying the repaired tendo achilles. Primary repair and closure are possible however the suture line is prone to complications like infection, suture dehiscence, skin necrosis. Such complicated primary cases, cases presenting late, recurrent rupture of tendo achilis, delayed exposure of TA and open TA injuries associated with skin avulsion require a flap cover for successful eventual outcomes. Various flaps have been described for cover over TA such as distally based skin flaps, advancement flap, free tissue transfers and islanded flaps [3-9]. The advent of islanded VY advancement flaps has changed the approach to reconstruction in general. Presence of abundance of perforators in the lower third of the leg arising from the posterior tibial and peroneal vessels is very well documented in literature. This report was done to establish the reliability of islanded VY advancement flaps based on the posterior tibial or peroneal vessels for coverage of defects over TA region and examine if such flaps are an ideal solution to this challenging problem.

CASE

A 34-year-old male had an injury over left TA region following trauma causing a raw area near its insertion. The patient was counseled, preoperative investigations for fitness for surgery were done. Pre-operative doppler was done to mark the perforator.

Patient was posted for OT under spinal anaesthesia. Pre-operative painted draping done. Patient was in prone position. Marking of defect and flap was done. Doppler reconfirmed position of the perforator. Flap was incised at lateral margin, dissection was done to identify the perforator, rest of the flap was raised identifying the perforator. Skin margins of the defect were excised, intra operative flap margin oozing of bright red blood confirmed. Flap was then advanced in an VY manner and inserted to defect. Cleaning and dressing were done. Plaster was applied.



Fig 1: preop image with marking



Fig 2: intraop image showing perf



Fig 3: intra op image of perf



Fig 4: post op image

The flap remained healthy in the post op period. Sutures were removed on 14 day and slab after 4 weeks. Patient was kept on post-operative physiotherapy.

Discussion

Reconstruction of soft tissue defects overlying the Achilles tendon is extremely challenging. Wound healing by secondary intention in this highly mobile area is prolonged and may lead to chronic, intractable wounds^[10]. Skin grafting is indicated only in few cases^[11]. To preserve function of the tendon, soft tissue reconstruction must not only cushion the tendon, but also permit gliding. Shoes can be worn if the transferred tissue is not bulky. In order to minimize unstable scar formation, transferred tissue must resist pressure and friction exerted by the footwear during walking^[12].

Because of the relative simplicity and to avoid unnecessarily need for microsurgery, local flaps are favored^[13]. On contrary to muscle flaps, fasciocutaneous flaps are functionally less compromising. Flaps such as the lateral supramalleolar flap and the lateral calcaneal flap are good options for soft tissue coverage, whereas the sural artery flap and the dorsalis pedis flap sacrifice a nerve or a major vessel and do not allow for primary closure of the donor site^[14].

Free flaps are suitable for more extensive trauma, major avulsions and long defects, the procedure needs advanced skills, instrumentation, equipment and prolonged operating time.

The presence of multiple perforators in the lower third of leg arising from the posterior tibial and peroneal arteries are an added advantage for choosing Islanded VY flaps as the entire procedure can be performed with ease without change of patient position and proper view of surgical field with closure of donor defect primarily.

Long term follow-up with physiotherapy achieved excellent function of tendo achilles with no complaints of skin necrosis. Patient was satisfied with the overall result.

Conclusion

Flap cover for the repaired tendo achilles is necessary in secondary rupture, avulsion type of open tendo achilles injuries, primary closure leading to suture dehiscence or in cases of skin necrosis. Local flaps are flaps of choice in moderate size defects. Islanded VY Advancement flaps should be considered as a choice in TA defects. Caution should be taken in presence of chronic inflammation and soft tissue fibrosis. Islanded VY Advancement flaps offer a single stage procedure, good aesthetics, and excellent recovery of function of tendo achilles and providing a stable skin cover with closure of secondary defect.

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