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RESEARCH ARTICLE

RESULTS OF EAR SURGICAL REPAIRE OF SCIATIC NERVE INJURY

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ABSTRACT

The aim of this case study is to evaluate the result of early surgical repair of complete cut sciatic nerve injury. A case of sciatic nerve injury at thigh level, the etiology of the injury was close range high velocity military weapon shot which resulted in open fracture of the left femur, Gustillo type IIIB and neurotemesis of sciatic nerve at thigh level, primary epineural repair was performed. Muscle strength and reflex changes were observed during stages of treatment. Muscle strength was assessed according to the British Medical Research Council scale. The Semmes-Weinstein monofilament test was used for sensory evaluation. The follow-up period was 2 years. The Tibial nerve component the gastrocnemius/soleus muscle strength recovered completely (power M5) and adequate plantar protective sensation, for the peroneal nerve component the muscle strength assessed as follows: anterior tibialis M4, extensor digitorum M5 and extensor hallucis M4, with adequate sensation on the dorsum of the foot. **Conclusion:** low expectation following sciatic nerve repair in the past is now replaced by more optimistic results with early primary repair of sciatic nerve injury even in contaminated wounds, and with vigorous prolonged physiotherapy and use of proper orthosis.

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INTRODUCTION

Sciatic nerve injury is an uncommon nerve injury when compared to upper extremities peripheral nerves injury ,although it is the longest and widest peripheral nerve in the body, common causes of sciatic nerve injury are iatrogenic injury caused by injections and hip surgeries, penetrating injuries ,and firearm injuries (Villarejo *et al.,* 1993; Haidukewych *et al.,* 2002). Sciatic nerve injury in the upper part of the thigh leads to pain and paresthesia along the nerve territory, loss of foot plantar flexion and dorsiflexion, Loss of sensation involves the posterior thigh, lateral aspect of the lower leg, and the entire foot. Vasomotor alterations such as coldness, erythema, thinning of the skin, nail deformities, and edema may accompany these conditions. With appropriate treatment, it is possible to reduce pain, motor and sensory deficits resulting of sciatic nerve injuries. The Sciatic nerve is composed of two nerves covered by a common sheath in the thigh region, but can easily be separated with dissection. The consequences of trauma and outcomes of surgery both differ for these two individual nerves and, therefore, should be addressed independently (Millesi *et al.,* 1987).

PATIENTS AND METHODS

30 years old patient, presented to our department with history of close range military weapon injury at the upper thigh level, resulted in open fracture of the left Femur, Gustillo-Anderson type IIIB with complete cut of Sciatic nerve the wound was heavily contaminated with soil. The patient were evaluated with **X** rays and laboratory tests. In operative theater the patient were placed on lateral position, vigorous cleaning and debridement were performed and external fixator were applied for the femur. Both ends of injured Sciatic nerve were detected and it was possible to made primary repair without tension. Epineural repair were performed with 6/0 non absorbable suture, after 3 weeks the external fixator were removed and intramedullary nail were applied and split thickness skin graft were performed to the wound, The patient was treated with vigorous physical therapy for the mobilization of the injured extremity. To prevent Achilles tendon shortening, a drop foot splint was used and the patient was encouraged for walking. Muscle strength was assessed according to the MRC scale (British Medical Research Council).The Semmes-Weinstein monofilament test was used for sensory evaluation. Early electromyographic tests were not performed in the first 2-3 week period since it was too early for target muscles to show signs of innervation Recovery was monitored by serial physical examinations and nerve conduction studies. The most distal point of axonal regeneration was determined by the observation of distally migrating Tinel-Hoffmann sign or nerve conduction response.

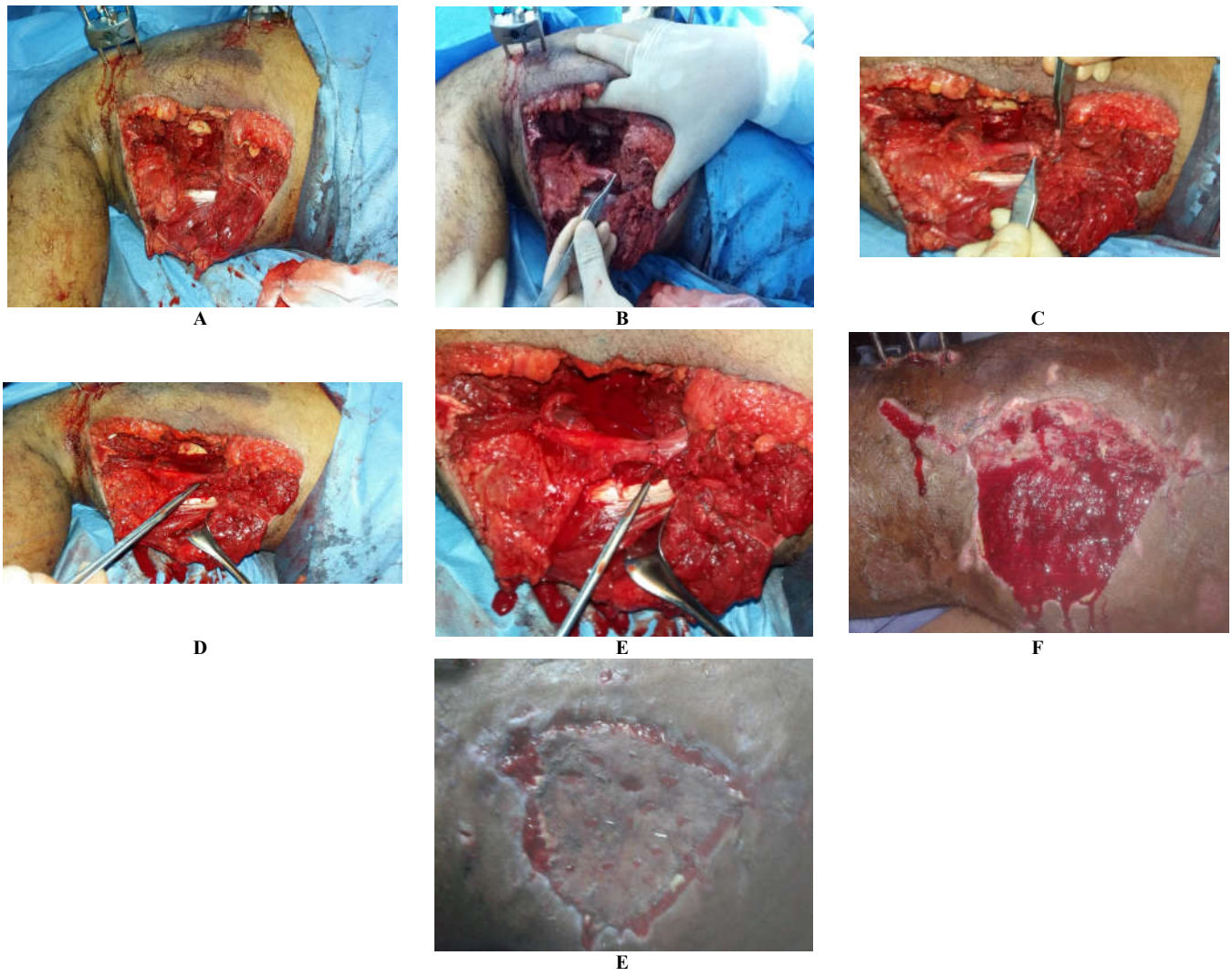

Fig 1. (A) wound debridement,(B,C) sciatic nerve identification, (D,E) sciatic nerve repair,(F)wound dressing, (G) split thickness skin graft

RESULTS

The patient underwent a vigorous course of physiotherapy for mobilization of the injured extremity, after about eight months the patient started to move the toes, the greatest functional improvement appeared after one and half year with muscle power as follow, Tibial nerve component the gastrocnemius/ soleus muscle strength recovered completely (power M5) and adequate plantar protective sensation. For the peroneal nerve component the muscle strength assessed as follows: anterior tibialis M4, extensor digitorum M5 and extensor hallucis M4, with adequate sensation on the dorsum of the foot.

DISCUSSION

The outcomes of nerve repair in general vary highly due to presence of multiple parameters affecting the result of nerve repair. Nonetheless, our result Show that adequate functional outcomes can be achieved, enabling the patients to pursue their daily activities. Restoration of plantar sensation is paramount to prevent ulceration and pressure sores and this could be achieved at high rate with primary repair. Gousheh *et al.* reported that 86.3% of 504 patients with sciatic nerve injuries affecting the tibial component regained adequate muscle power (M3 or higher) and were able to walk within two years, and that sensation in the sole was obtained in 73.4%. The rates of recovery in both motor and sensory functions were higher in cases in which repair was possible with direct coaptation. In contrast, the success rate was as low as 38.9% in injuries involving the peroneal component, being even lower in patients undergoing nerve graft repairs. Kim *et al.* (2004) reported the success rates of primary repair as 87% and 63% in injuries affecting the tibial and peroneal components, respectively. Similarly, the use of nerve grafts was associated with a lower successrate. Our outcome was similar to these two large series. However, special attention should be paid to evaluate each case individually, as peroneal regeneration might be better in some cases undergoing repair of both peroneal and tibial components. Moreover, motor and sensory outcomes might not be in total concordance. Inferior outcomes after repair of peroneal component injuries have been well documented in the literature and several explanations have been put forward, including increased vulnerability of the nerve to trauma due to its more lateral and superficial location, poor blood supply, the presence of less connective tissue between the fascicles, and the position of the motor fascicles within the nerve (Garozzo *et al.,* 2004; Korompilias *et al.,* 2006). Many types of orthosis have been proposed to prevent joint contractures caused by sciatic nerve injuries and to enhance mobilization. Most of them aim to solve problems associated with drop foot, but some problems may arise with

their long-term use. Various tendon transfers can eliminate the need for the use of orthosis, the most common being the transfer of the posterior tibial tendon to the anterior tibial tendon (Bourrel *et al.,* 1967; Wiesseman *et al.,* 1981). Wood (Wood *et al.,* 1991) emphasized the need for tendon transfer in addition to nerve repair in cases with a nerve defect greater than 6-8 cm or in cases in which delay in nerve repair exceeded 6-9 months. Aydın *et al.* prefer to reserve tendon transfer until the outcomes of nerve surgery becomes fully apparent, i.e., 1-1.5 years depending on the level of the lesion.

In Conclusion low expectation following sciatic nerve repair in the past is now replaced by optimistic results with early primary repair of sciatic nerve injury with vigorous physical therapy, even in contaminated wounds.

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