Abstract The case of a 16-year-old girl with a contracted scar on the popliteal fossa which impaired full extension of her left leg is reported together with the management of the case. Two serial skin expansions with an expander placed in the posterior proximal third of the leg were performed. The scar was completely excised and covered with the expanded skin. The result was fully successful, allowing full extension of the leg, and the aesthetic appearance was improved.

Keywords Tissue expansion · Scar · Popliteal fossa

Introduction

Soft-tissue expansion techniques allow enlargement of an area of normal skin adjacent to the defect using an implantable and inflatable device with a remote fill port. The device is gradually inflated to enlarge the skin, creating a skin flap, which is then advanced to reconstruct the lesion. As clinical experience has developed over the years and the safety of the method has improved, but its use in the lower extremities, especially below the knee, remains somewhat problematic [2, 6]. Here we report a case of a large reconstruction of the popliteal fossa with serial tissue expansions in an attempt to avoid functional impairment and to improve the aesthetics of the area, i.e., not to add new scars.

Case report

A 14-year-old female was involved in a motorcycle accident. A large area of tissue was lost from the left popliteal fossa. In addition, there was a laceration on the posterolateral aspect of the leg. Treatment was with a split-thickness skin graft and suture of lacerations. Two years after the accident, she returned complaining of tethering of the skin graft, which affected her walking. She also wanted improvement in the aesthetic appearance.

On examination, there was a 14×11-cm skin graft (horizontal and vertical dimensions) on the left popliteal fossa, adherent to the hamstring. Another scar 8 cm in length and ranging from 1 cm to 4 cm wide ran from the external side of the graft to the lateral proximal third of the posterior surface of the leg (Fig. 1). Full movement of the leg was impaired, with a 10° loss of extension. The plan was to expand the area below the scar.

Under epidural anesthesia, a 14×8-cm horizontally oriented oval expander was placed. This was inserted by blunt dissection superficial to the fascia of the gastrocnemius muscle immediately caudal to the scar of the graft, adherent to the hamstring. Another scar 8 cm in length and ranging from 1 cm to 4 cm wide ran from the external side of the graft to the lateral proximal third of the posterior surface of the leg (Fig. 1). Full movement of the leg was impaired, with a 10° loss of extension. The plan was to expand the area below the scar.

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Several flaps have been proposed for cover in this area, but all have the drawback of leaving a secondary defect in the flap donor area. This is not acceptable, especially in young patients. In contrast, tissue expansion can create extra skin of the same quality without producing new scars.

Soft-tissue expansion on the leg has been employed by other authors to reconstruct traumatic amputations, providing high-quality coverage and helping the patients to accept the prosthesis [7, 12]. May and Sheppard placed the expander on the proximal posterior surface of the leg just below the popliteal fossa. These authors advanced a proximal-based flap distally to resurface the stump of the leg [7]. The placement of the expander used in this case was the same as that of May and Sheppard. Our flap was distally-based because it had to be advanced mainly in a cephalic direction and also, to a lesser extent, in the external direction in order to excise the lateral area of the scar. This prevented the creation of new scars, since there was already one present on her leg. Other authors have placed expanders on the anterior surface of the knee to reconstruct scars in the popliteal fossa [11] or an ulcer in the prepatellar region [13]. The most frequent use of posterior expanders on the leg has

Fig. 1a, b Photograph of the popliteal fossa showing the skin-grafted area and the scar from the posterior surface of the leg. Of the two possibilities of placing the expander, the horizontal orientation was chosen. a Posterolateral view. b Posteromedial view

Fig. 2a, b Result 18 months after the last reconstructive procedure with removal of the entire graft. a Posterolateral view. b Posteromedial view