Free Neurovascular Latissimus Dorsi Muscle Transplantation for Reconstruction of Hip Abductors

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Summary: Resection of tumors affecting the hip abductors can cause significant decrease in muscle strength and may lead to abnormal gait and poor function. We present a case report showing full functional recovery after resection of a synovial sarcoma affecting the right gluteus medius and minimus muscles with reconstruction free neurovascular latissimus dorsi muscle transplantation. The latissimus dorsi muscle was harvested following standard technique and fixed to the ilium and the greater trochanter. Receptor vessels were end-to-end anastomosed to the subscapular vessels followed by an end-to-end epineural suture between the superior gluteal nerve and the thoracodorsal nerve. A year after surgery, there is no evidence of recurrent disease; electromyographic analysis shows complete reinnervation of the latissimus dorsi muscle flap, and the patient has achieved full functional recovery. Free functional latissimus dorsi transfer could be considered as a viable reconstruction technique after hip abductor resection in tumor surgery. (Plast Reconstr Surg Glob Open 2017;5:e1498; doi: 10.1097/GOX.0000000000001498; Published online 26 September 2017.)

CASE REPORT

A 43-year-old man presented to our outpatient clinic with a growing soft-tissue mass in the right buttock. His hip range of motion and walking were unaffected. Pelvic magnetic resonance imaging then revealed a 5-cm soft-tissue mass within the right gluteus medius compatible with an STS (Fig. 1). Biopsy and chest computed tomography diagnosed a localized high-grade synovial sarcoma. The patient was given 3 doses of ifosfamide neoadjuvant chemotherapy without complications. Then, additionally to a wide resection of the right gluteus medius and minimus muscles, we proposed reconstruction with a free functional latissimus dorsi flap to diminish functional sequelae of severe hip abductor insufficiency (Fig. 2). Informed consent from the patient was obtained for publication of the case.

Surgical Technique

The patient was placed in a left lateral decubitus position. After identification and isolation of the recipient vessels, the latissimus dorsi muscle was harvested following standard technique and fixed to the ilium and the greater trochanter. Receptor vessels were end-to-end anastomosed to the subscapular vessels followed by an end-to-end epineural suture between the superior gluteal nerve and the thoracodorsal nerve. A year after surgery, there is no evidence of recurrent disease; electromyographic analysis shows complete reinnervation of the latissimus dorsi muscle flap, and the patient has achieved full functional recovery. Free functional latissimus dorsi transfer could be considered as a viable reconstruction technique after hip abductor resection in tumor surgery.

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perior gluteal vasculonervous bundle, gluteus medius and minimus muscles were resected including their insertion with a greater trochanter ostectomy. The latissimus dorsi muscle was harvested following standard technique applying tension suture markers at 5-cm intervals, which had been marked before its desinsertion and including an 8 × 4 cm skin paddle as a vascular postoperative monitor. After its tubulization, anchor screws (Arthrex) and 2 Trevira meshes (Implantcast GmbH, Buxtehude, Germany) were used to suture the muscle flap to the ilium and the greater trochanter with proper tension maintaining the hip at 30 degrees of abduction (Fig. 3).

Receptor vessels were end-to-end anastomosed to the subscapular vessels followed by an end-to-end epineural suture between the superior gluteal nerve and the thora-codorsal nerve. There were no intraoperative complications.

Postoperative Care

The definitive biopsy confirmed synovial sarcoma with negative margins. Surgical wounds healed uneventfully. Six weeks after surgery, standard adjuvant radiotherapy was applied to the postoperative tumor bed in a schedule of 1.8 Gy/fraction, 5 fractions per week and for 6 weeks, for a total dose of 63 Gy. Physical therapy was initiated after the first week. The patient regained partial abductor strength after 2 months walking without aids and with minor limp, then progressing to full muscle strength at 4 months. A year after surgery, there is no evidence of disease, electromyographic analysis shows complete reinnervation of the latissimus dorsi muscle flap (Fig. 4), the patient has
achieved M5 abductor strength, walking without limp, and he can even run short distances (see video, Supplemental Digital Content 1, which displays the patient 1 year after surgery, http://links.lww.com/PRSGO/A535).

DISCUSSION

STSs occur predominantly in the lower extremities, mainly in the thigh, and occasionally in the gluteal region. Advances in surgical techniques have made wide buttockectomy the procedure of choice preferentially over internal/external hemipelvectomy. Depending on the size, location, and depth, resection can affect not only the gluteus maximus but also the medius and minimus, causing severe abduction deficiency and abnormal Trendelemburg gait. This was evident from the immediate postoperative period when our patient was unable to abduct the hip and required crutches for walking due to the local muscle deficiency caused by the resection.

We opted for a free functional latissimus dorsi transfer as a first option for reconstruction. Less complex techniques such as the muscleplasty described by Whiteside require remnant muscle stumps of the gluteus medius to offer guarantee to the suture repair and are also more appropriate for low demand older patients. Pedicled ascent of the vastus lateralis would debilitate the quadriceps and was left as a second option in case the free flap failed. We also opted for the latissimus dorsi over a gracilis muscle transfer due to higher muscle power and better versatility to reconstruct the...
This reconstruction enabled the patient to fully recover hip abduction even against moderate resistance and functionally allowed him to recover unaided walking and running short distances. This excellent result enables the free functional latissimus dorsi transfer to be considered a viable reconstruction technique for hip abductors resection in tumor surgery.

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