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Original Research

Latissimus Dorsi Transfer for Triceps Brachii Reconstruction in a Patient with Leiomyosarcoma of the Triceps Brachii: Technique and Case Report

Transferência do músculo grande dorsal para reconstrução do tríceps braquial em paciente com leiomiossarcoma do tríceps braquial: técnica e relato de caso

Colgajo de dorsal ancho para reconstrucción de tríceps braquial en paciente con leiomiosarcoma de tríceps braquial: técnica y reporte de caso

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Abstract
Reconstruction surgeries for malignant soft tissue tumors challenges many surgeons and orthopedic centers. Few cases of triceps brachii leiomyosarcoma reconstruction have been described. There are tunneling techniques already described by other authors. This study aims to report a case of oncological reconstruction of the triceps brachii using the large Latissimus Dorsi flap in a 60 years-old male patient with leiomyosarcoma in the triceps brachii. The patient achieved full recovery of triceps brachii function after eight weeks. The microsurgical options could be helpful in the management and reconstruction of the leiomyosarcomas in patients without limb amputation indication.
Descriptors: Leiomyosarcoma; Microsurgery; Neoplasms.
Resumo
As cirurgias de reconstrução de tumores malignos de partes moles desafiam muitos cirurgiões e centros ortopédicos. Poucos casos de reconstrução de leiomiossarcoma do tríceps braquial foram descritos. Existem técnicas de tunelização já descritas por outros autores. Este trabalho tem como objetivo relatar um caso de reconstrução oncológica de tríceps braquial com retalho grande de grande dorsal em paciente do sexo masculino, 60 anos, com leiomiossarcoma no tríceps braquial. O paciente obteve recuperação completa da função do tríceps braquial após oito semanas. As opções microcirúrgicas podem ser úteis no manejo e reconstrução dos leiomiossarcomas em pacientes sem indicação de amputação de membros.
Descritores: Leiomiossarcoma; Microcirurgia; Neoplasias.
Resumen
Las cirugías de reconstrucción de tumores malignos de tejidos blandos son un desafío para muchos cirujanos y centros ortopédicos. Se han descrito pocos casos de reconstrucción de leiomiosarcoma del tríceps braquial. Existen técnicas de tunelización ya descritas por otros autores. Este estudio tiene como objetivo reportar un caso de reconstrucción oncológica del tríceps braquial utilizando el colgajo grande de dorsal ancho en un paciente masculino de 60 años con leiomiosarcoma en el tríceps braquial. El paciente logró la recuperación total de la función del tríceps braquial después de ocho semanas. Las opciones microquirúrgicas podrían ser de ayuda en el manejo y reconstrucción de los leiomiosarcomas en pacientes sin indicación de amputación de extremidades.
Descriptores: Leiomiosarcoma; Microcirugia; Neoplasias.

INTRODUCTION

In the last years, the oncological reconstruction for malignant soft tissue tumors has frightened many orthopedic surgeons and orthopedic centers. The advance in resection techniques and the better understanding of the malignant tumor and its classifications have encouraged orthopedic surgeons to effort limb salvage procedures.

Regarding Leiomyosarcoma, a malignant soft tissue tumor, the reconstruction is an interesting point when considering the need for radical resection. Given this, some muscles there are unique for the function of the limb. The triceps brachii is the major (and only functional) elbow extensor. Thus, the radical resection of the margin should be managed with a muscle transfer if reconstruction is needed[1-4].

A few cases of triceps brachii leiomyosarcoma reconstruction have been described. There are tunneling techniques already described by other authors. Hovnanian described the Latissimus Dorsi flap to restore elbow extension by attachment in the olecranon. Chang et al. described a Latissimus Dorsi flap to Triceps Brachii transfer using a one-staged tunneling technique. Other authors reproduced the same results for achieving elbow extension.

The primary use for this technique is loss of coverage, wound defects, and sequelae nerve injuries. The advances in limb salvage procedures and reconstructions made it possible to use this technique for Leiomyosarcoma[1-5].

This study aims to report a case of oncological limb salvage reconstruction of the triceps using the large Latissimus Dorsi flap in a 60 years-old male patient with leiomyosarcoma in the triceps. The patient achieved full recovery of triceps function after eight weeks.

This study aims to report a case of a Latissimus Dorsi Flap transfer to Triceps Brachii reconstruction for a limb salvage reconstruction and elbow extension in a patient with Leiomyosarcoma of the Triceps Brachii.

CLINICAL CASE

A 60-year-old right-handed male patient with leiomyosarcoma in the right triceps brachii underwent wide resection of the right triceps long head in November of 2020. Unfortunately, he had local recurrence of the tumor, and a Radical resection of the triceps brachii was planned. The patient was positioned in the left lateral decubitus position with the right arm on an arm holder. The orthopedic oncologic division performed the radical resection of the right triceps. Intraoperative frozen section analysis of margins was used and confirmed free margins after resection. The elbow was left only with the ulnar nerve released and the bone exposed, and coverage was needed (Figure 1).

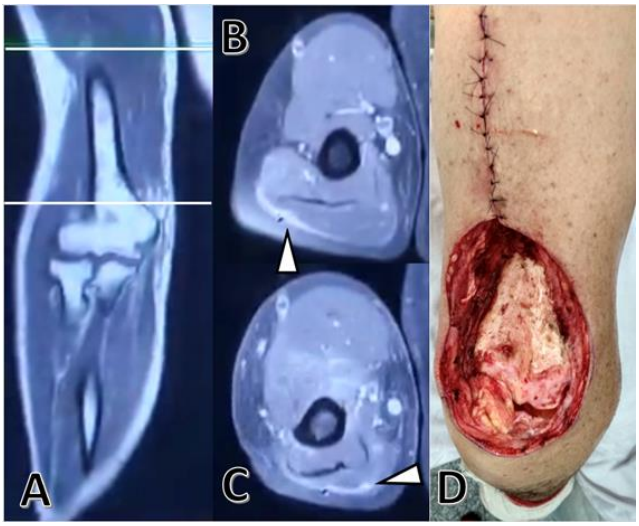

Figure 1: Preoperative MRI recurrent findings aspects. **A:** Coronal MRI window level. **B and C**: axial views (arrowhead: local recurrence). **D:** Intraoperative resection. Note that the suture stitches are there while waiting for the Intraoperative frozen section analysis of margins.

The preoperative microsurgery team included a one-stage Latissimus Dorsi Flap (LDF) to Triceps Brachii. An Island Skin was designed to reconstruct the elbow extension and wound coverage (Figure 2). The LDF was raised with the nerve, and a tunnel was made between the posterior axillary fold and the upper arm, passing throw the posterior deltoid.

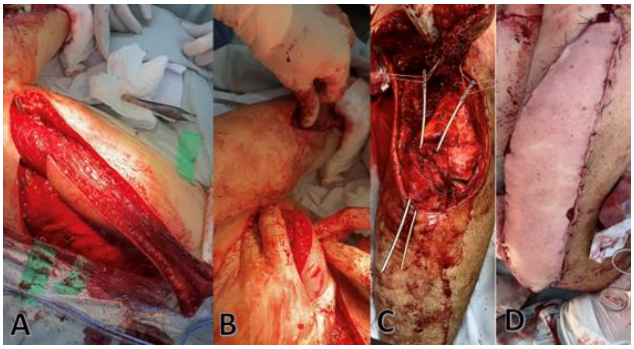

Figure 2: Intraoperative Latissimus Dorsi Functional Flap to Triceps Brachii steps. **A:** Flap Raised. **B:** Tunneling. **C:** Olecranon transosseous suture. **D:** Wound coverage final aspect.

The LDF was attached to the olecranon using transosseous suture and high-strength threads. The reconstruction suture tension was evaluated intraoperatively by passive range of motion. Wound closure was performed, and the patient used a sling for comfort and to keep the arm adducted. Wound closure was performed, and the patient used a sling for comfort and to keep the arm adducted.

The postoperative protocol included Latissimus Dorsi stimulation movements and proprioceptive training by the physiotherapy team. The patient could extend the elbow while being incentivized to extend the shoulder, stimulating the Latissimus Dorsi. At four weeks, the patient was asked to walk using a crutch to document the triceps power (Figure 3).

Figure 3: Range of motion, three weeks postoperative. **A.** Elbow extension while activating latissimus dorsi muscle. **B:** Elbow power while gait using a crutch.

DISCUSSION

The management of Leiomyosarcomas is a challenge. Good preoperative planning needs

to be done when the goal is to restore limb function. However, radical excision is commonly required, becoming necessary functional muscle transfers that achieve coverage when needed[1-6].

This case report is unique because it is a Leiomyosarcoma in the Triceps Brachii. The patient was submitted to a Latissimus Dorsi Flap Functional Transfer to restore elbow extension (Triceps Brachii Function).

The postoperative protocol was successful, and the patient could restore his functions and daily activities.

The main advantage of using this technique is that the Latissimus Dorsi Flap is a dispensable donator. Furthermore, there are a few morbidities in the donator area, and the limb function used to be preserved[7]. We expect to encourage microsurgeons to manage this reconstruction with the Orthopedic Oncological Division to achieve good functional outcomes.

FINAL CONSIDERATIONS

Latissimus Dorsi Flap to Triceps Brachii Microsurgical biological reconstruction can successfully manage malignant soft tissue tumors to achieve triceps and elbow extension function.

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CONFLICTS OF INTERESTS

The authors declare no conflicts of interests.

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