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Case Report

Reconstruction of Broad Soft Tissue Defect around Knee with Combined Perforator Flaps

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ABSTRACT

Perforator flaps have been commonly used in reconstruction of soft tissue defects nowadays, however, it is very important to apply them properly according to the characteristics of recipient site. Since there is no universal flap appropriate to various types of defects, there have been a number of researches to apply appropriate perforator flaps suitable to recipient sites. Recently, achievements have been made by applying chimeric flaps based on perforators from a source artery and combined flaps based on perforators from different source arteries. For examples, combined flaps of deep femoral perforator and gracilis perforator, lateral circumflex femoral artery and tensor fascia lata perforator and lateral vastus muscle and anterior, lateral thigh perforator have been suggested in the literatures. It is a key point to use appropriate perforator flap minimizing donor site morbidity according to the location and size of defects. We are describing a case of covering a soft tissue defect at the knee with combination of medial sural artery perforator flap and medial vastus medialis artery perforator flap.

Key words: Combined Perforator Flap, Flap surgery, Knee Reconstruction, Medial Sural Artery Perforator Flap, Medial Vastus Medialis Artery Perforator Flap, Soft Tissue Defect.

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INTRODUCTION

Soft tissue defects around the knee pose significant challenges for reconstructive surgeons due to the need for adequate coverage, functional preservation and minimal donor site morbidity. Various local, regional and free flaps have been employed for knee reconstruction; however, a single flap is often insufficient for large or complex defects. Perforator flaps have emerged as a preferred choice in reconstructive surgery due to their ability to provide well-vascularized tissue while minimizing donor site morbidity.

In recent years, the concept of combined perforator flaps has gained attention, allowing surgeons to utilize two or more flaps from different source arteries to achieve better coverage and flexibility in design. By strategically selecting and combining perforator flaps, it is possible to reconstruct extensive defects while preserving the functional and aesthetic integrity of the donor and recipient sites.

In this article, we present a case of a 36-year-old female patient with a broad soft tissue defect around the knee, which was successfully reconstructed using a combination of medial vastus medialis artery perforator flap and medial sural artery perforator flap. This approach provided sufficient coverage while maintaining the mobility and structural integrity of the knee joint, demonstrating the efficacy of combined perforator flaps in complex lower limb reconstruction.

SURGICAL PROCEDURE

We are describing the procedure in a 36-year-old female patient with broad scar and chronic ulcer upon knee region with stiffness of knee joint. There was a scar measuring 20×18 cm on the lateral side of the right knee. The surgical procedure was represented with Figures 1 to 7.

There was no evidence of destruction of articular facet in X-ray. In order to cover the recipient site, two perforator flaps were designed in combination around the knee joint; medial vastus medialis artery perforator flap measuring 10×18 cm in the anteriomedial aspect of the thigh and medial sural artery perforator flap measuring 10×15 cm in the calf. The donor sites underwent primary closure and skin grafting. The flaps survived completely and the wounds healed by first intention.

We achieved a good coverage for broad soft tissue defect which was disable to cover with one flap around the knee with a combined perforator flaps.

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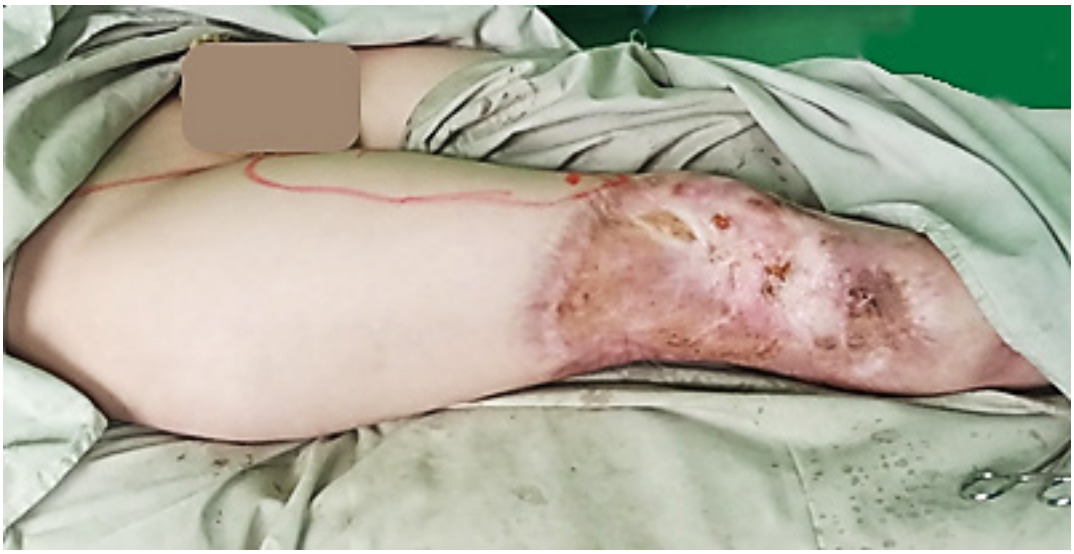

Figure 1: Pre-operative view.

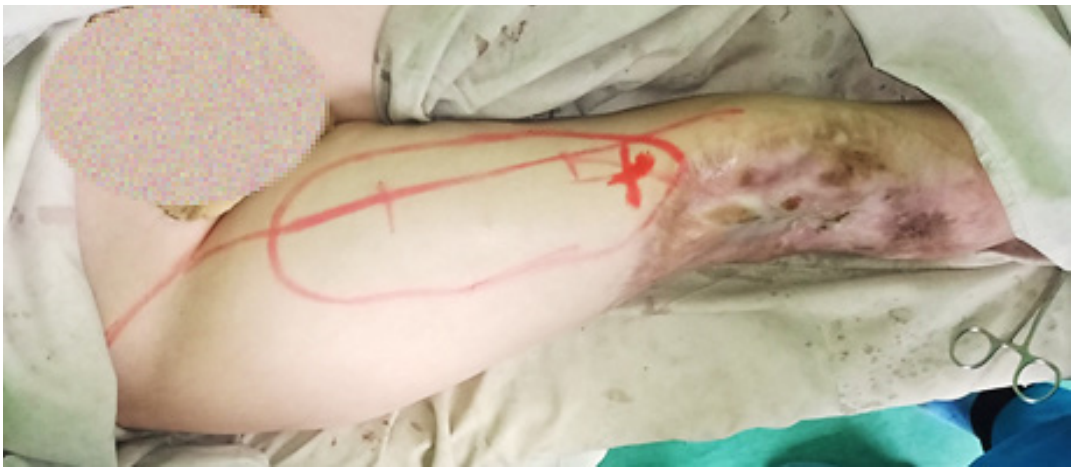

Figure 2: Design of the medial vastus medial artery perforator flap.

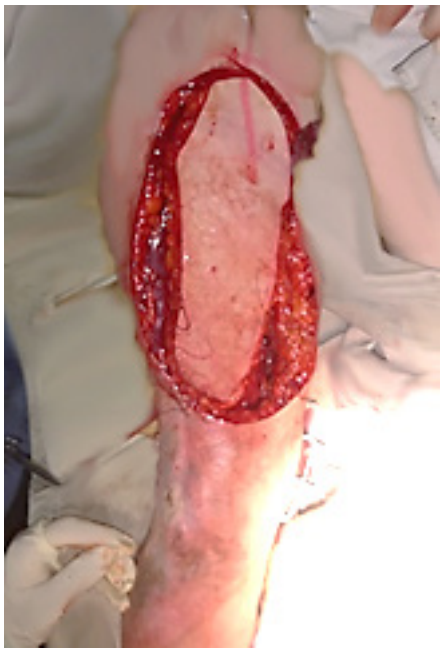

Figure 3: Elevation of the medial vastus medial artery perforator flap.

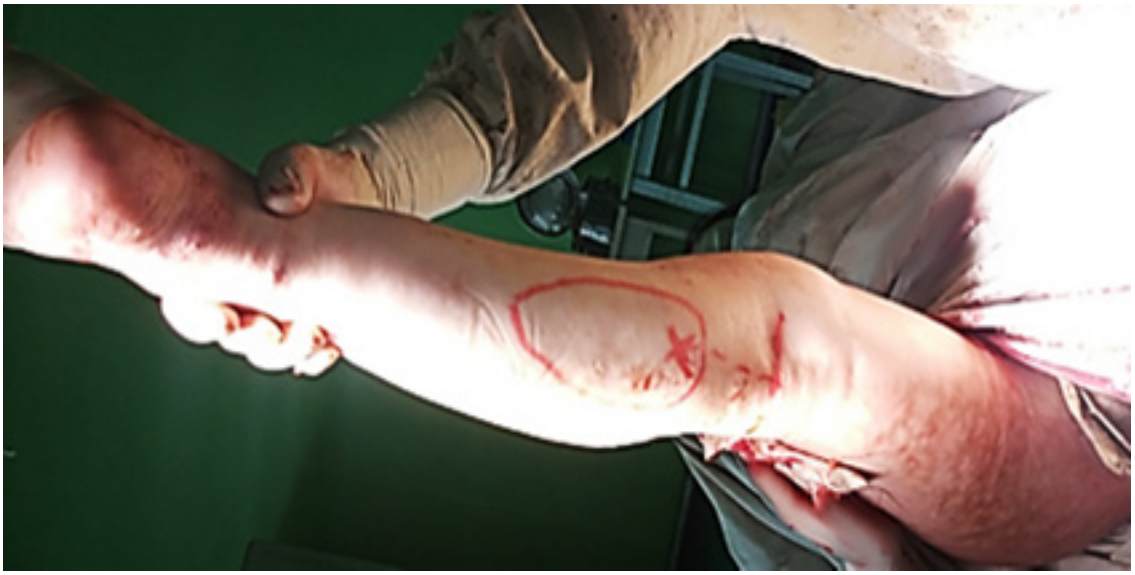

Figure 4: Design of the medial sural artery perforator flap

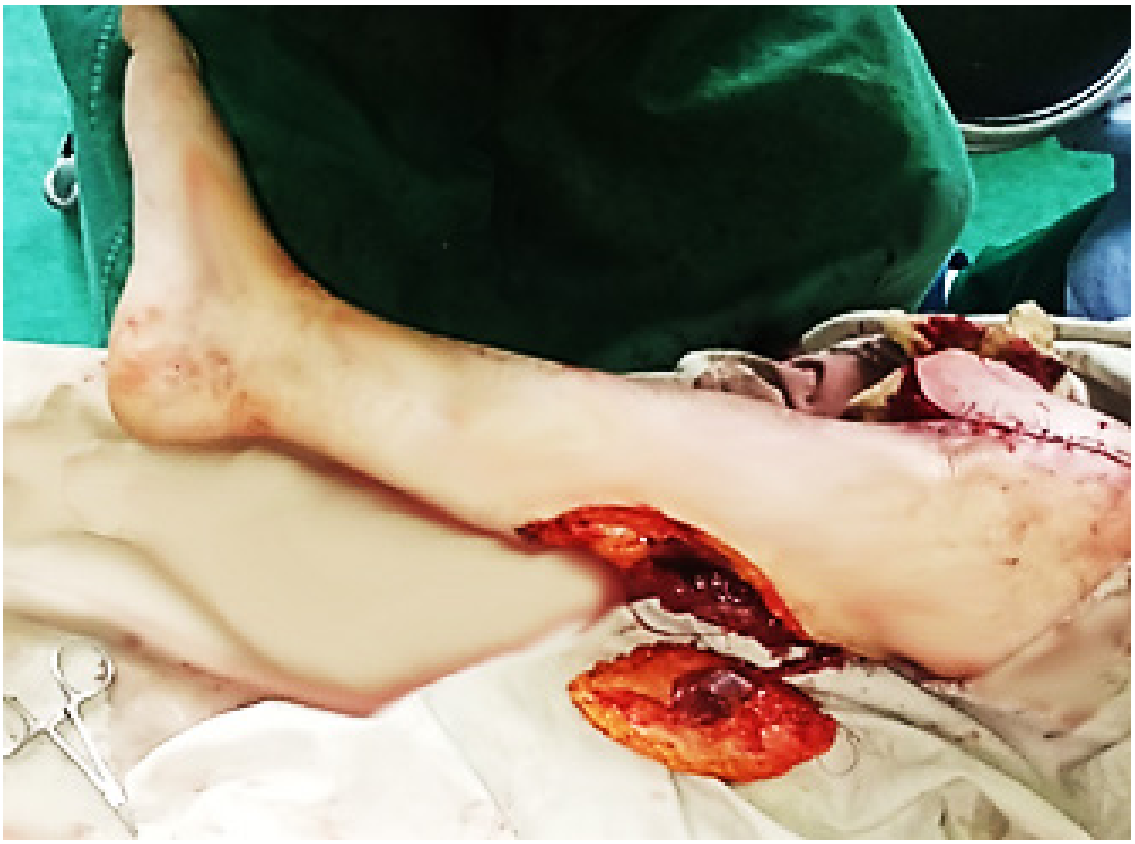

Figure 5: Elevation of the medial sural artery perforator flap.

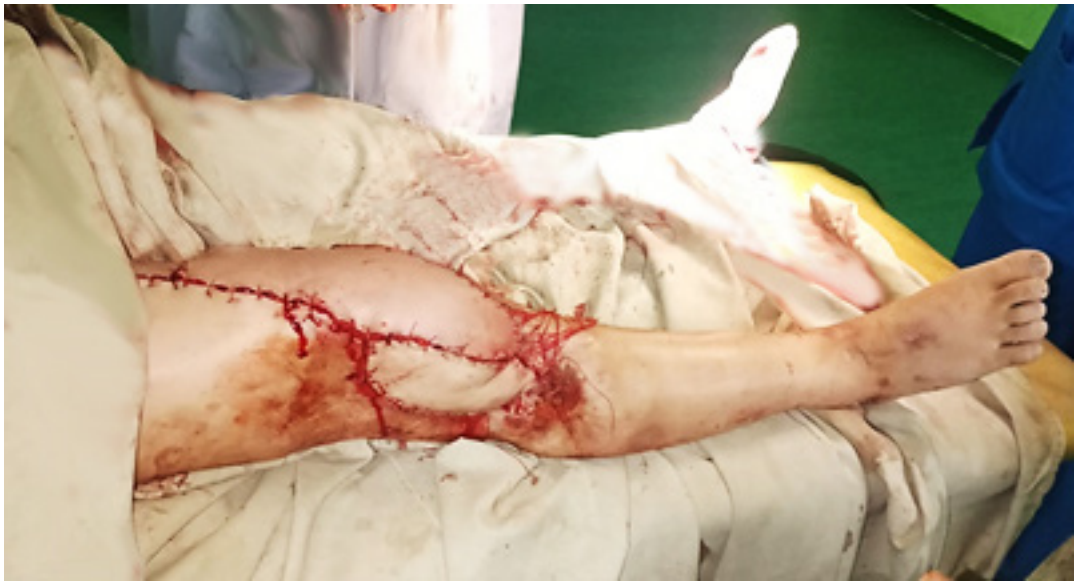

Figure 6: Postoperative view of combined flap based on medial vastus medial artery and medial sural artery perforators.

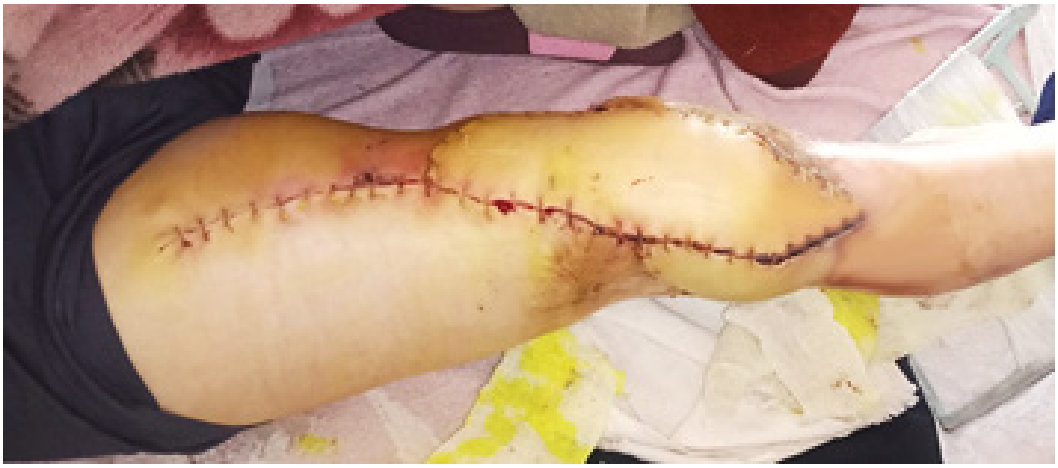

Figure 7: View of 14th Postoperative day.

DISCUSSION

Choosing appropriate flaps according to characteristics of defect is a fundamental problem for achieving goals of reconstruction.[1,2] Furthermore, in cases of reconstructing broad soft tissue defect, occasionally combine different flaps since coverage with one flap is insufficient. In that case what flaps to use and how to combine flaps are key factors judging success of operation.[3-5] Recently, several combined flaps and chimeric flaps such as combined lateral circumflex femoral artery perforator flap, combined medial sural artery perforator flap and chimeric descending genicular artery perforator flap are successfully used in reconstructive surgery.[6,7] We reconstructed broad scar around knee with combination of medial vastus medial artery and medial sural artery perforator flaps.

CONCLUSION

We reconstructed broad scar around knee with combination of perforator flaps and paved the way for following orthopedic arthroplasty.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

MVMP: Medial Vastus Medialis Artery Perforator; **MSAP:** Medial Sural Artery Perforator.

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