

OUTCOMES OF PROPELLER FLAPS FOR RESURFACING LEG DEFECTS

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INTRODUCTION

Perforator based Propeller flaps offer a durable option for coverage of leg defects, especially the difficult to address areas involving the distal 1/3 of the leg, medial and lateral malleolus defects. However, they are technically demanding to execute.

To observe the outcomes which arose following execution of Propeller flaps for resurfacing leg defects, 18 patients underwent Propeller flaps for coverage of leg defects between December 2021 and November 2022 were included. Outcomes were affixed as uncomplicated healing, partial flap loss or total flap loss. Secondary procedures performed to manage the complications are also noted.

OBJECTIVES

To study the outcomes, and the management of the complications which arose following execution of Propeller flaps for resurfacing leg defects

REVIEW OF LITREATURE

The Propeller design flap was first described by Hyakusoku et al in 1991 to describe adipocutaneous flaps raised based on a subcutaneous pedicle and rotated through 90° to resurface defects following burn contracture release of the elbow and axilla

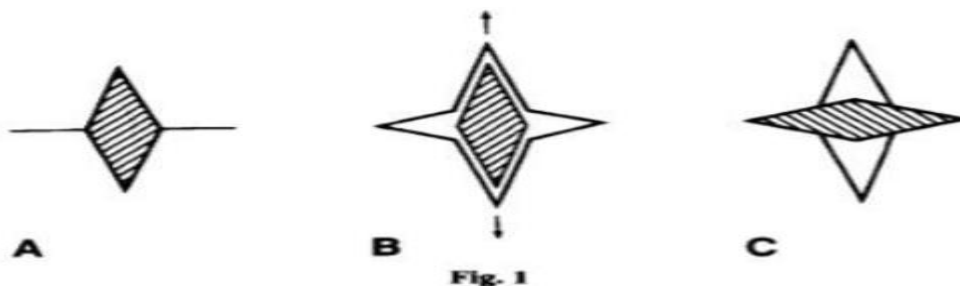
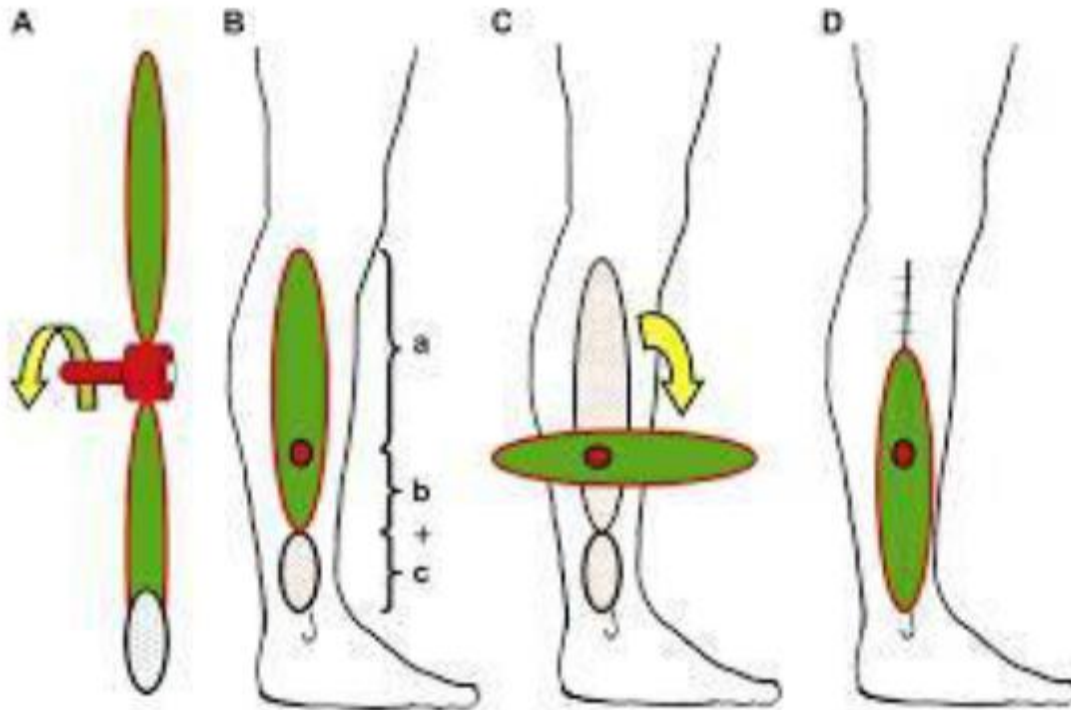


Figure 1—(A) Preoperative design of the flap. (B) Releasing a contracture. (C) The flap is elevated and rotated like a propeller.

Hallock in 2006, described the propeller design perorator flap where a fasciocutaneous flap was islanded on its perforator in the adductor compartment of posterior thigh, and the skin island was rotated through 180°. By doing this, a part of the flap (the larger 'blade') covers the defect, and the other part of the flap (the smaller 'blade') covers the secondary defect of the larger blade and helps in donor site closure



Teo greatly contributed to the definition and to the details of the surgical technique of perforator-based propeller flaps. A number of authors reported the application of the perforator propeller concept to the reconstruction of soft-tissue defects in different areas of the body

PATIENTS AND METHODS

- Period of study: between December 2021 and November 2022
- 18 patients were subjected to propeller flaps for post traumatic leg defects in the period of study
- Data was collected with regard to demographics, and outcomes affixed as Uncomplicated healing, partial flap loss or total flap loss
- The procedure done to manage the complication was also recorded

SURGICAL TECHNIQUE

- Perforators of the posterior tibial artery are marked pre operatively with a hand held Doppler
- After marking the requisite flap, an exploratory incision is made and perforators visualised entering the flap
- Once identified as having adequate calibre, the incisions on all borders of the flap are completed taking care to preserve all the perforators

- Clamps are applied on all perforators except the largest suitable distal perforator and flap viability is ascertained
- Once bright red bleeding is demonstrable at the tip of the flap, all other perforators are ligated
- The flap is islanded on the chosen perforator, also releasing the septum around the pedicle to facilitate rotation through 180° without causing kinking
- The donor site was closed with SSG

RESULTS

- Age ranged from 18 to 55 (mean age: 31.7)
- Right leg was operated on in 16 patients and left leg in 2 patient
- All patients sustained injury due to RTA with associated fractures
- The set of patients included 16 males and 2 females
- All 18 flaps were islanded on a single perforator from the posterior tibial artery, most frequently the perforators 7 – 9 cm and 10 – 12 cm proximal to medial malleolus
- Flap dimension ranged from 3 x 7 cm to 5 x 15 cm
- Donor site was covered with Split skin graft in all patients
- 14 patients had complete healing of the flap and donor site
- 3 patients developed partial flap loss necessitating second procedure
- 1 patient developed total flap loss necessitating second procedure

COMPLICATIONS

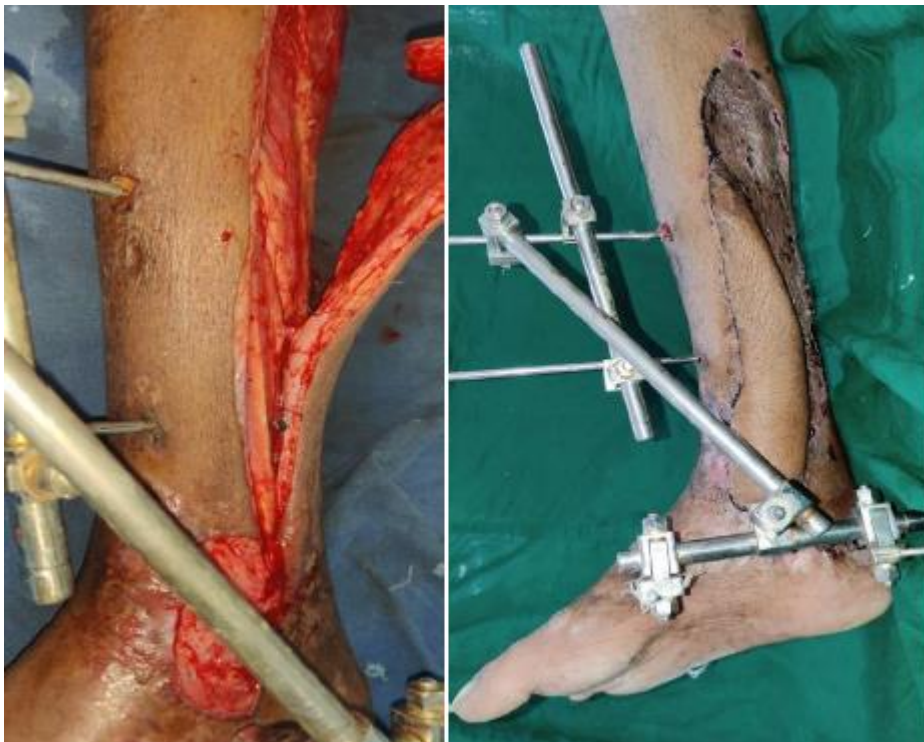
- 3 patients had a partial flap loss necessitating secondary procedures: Split skin graft was done in 2 patients, a second flap was done in 1 patient as the fracture site got exposed
- 1 patient developed total flap loss which was subsequently debrided and split skin graft, applied

REPRESENTATIVE CASES

1. 52 year old male with history of RTA and fracture medial malleolus, PTA perforator based Propeller flap done based on perforator 9 cm proximal to medial malleolus



2. 25 year old male who sustained RTA, compound fracture of distal third tibia for which external fixator was applied. Patient was later taken up for Propeller flap based on PTA perforator 8 cm proximal to medial malleolus



3. 30 year old female with RTA and fracture medial malleolus, PTA perforator based Propeller flap done based on perforator 9 cm proximal to medial malleolus. Patient developed partial flap loss which was treated with split skin graft



4. 24 year old male presented with soft tissue defect over the medial malleolus region of right leg following RTA and compound unicortical fracture of the medial malleolus. Patient was taken up for Propeller flap based on PTA perforator 6 cm proximal to medial malleolus. Patient developed total flap loss and taken up for Split skin grafting



CONCLUSION

The islanded propeller design flaps offer a useful option for reconstruction of lower limb defects, providing functionally and aesthetically acceptable results, and durable and reliable coverage for small to medium sized defects particularly over the distal third of the lower limb

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