



## INTRODUCTION

- The osteocutaneous fibula free flap (OCFFF) first introduced by Hidalgo<sup>1</sup> is currently the gold standard for composite maxillomandibular reconstruction.
- The fibula bone provides excellent bone stock, and the overlying leg skin provides adequate soft tissue for intraoral or external resurfacing.<sup>2-4</sup>
- Appropriate reconstruction of the lower leg donor site after skin paddle harvest is critical to minimize functional morbidity and optimize aesthetic outcomes.
- Traditionally, skin grafts have been utilized where primary closure is not possible. However, they are associated with short- and long-term morbidity, including delayed healing and poor aesthetic results.
- The use of local propeller flap reconstruction has been described in the literature to address these limitations.<sup>5-10</sup>
- Local propeller flaps in the lateral leg are typically based on either the perforators arising from the posterior tibial or the peroneal vessels.
- Given that the peroneal artery is sacrificed during a fibula flap harvest, using propeller flaps in this context poses challenges and is sometimes not feasible.
- While a few previous studies have detailed their experience with using propeller flaps for fibula donor site closures, no study to date has clearly demonstrated the anatomic considerations and indications.

## OBJECTIVE & METHODS

- Detail clinical anatomy and operative technique of utilizing local propeller flap for closure of osteocutaneous fibula donor sites
- Compare outcomes to conventional closure using skin grafts
- Prospective review of 21 consecutive patients undergoing propeller flap coverage for osteocutaneous fibula flap donor site coverage
  - Compared to historical cohort of all fibula flap donor sites closed with skin graft over the previous 5 years
- Data collection
  - Patient demographics
  - Perioperative characteristics
  - Postoperative outcomes (partial or total flap loss)

## SURGICAL TECHNIQUE

Figure 1: Flap design

A - Classic design of fibula skin paddle and propeller flap with the perforators marked with stars. B – Length of the tonearm flap is determined by the distance from propeller flap perforator to the end of donor site wound.

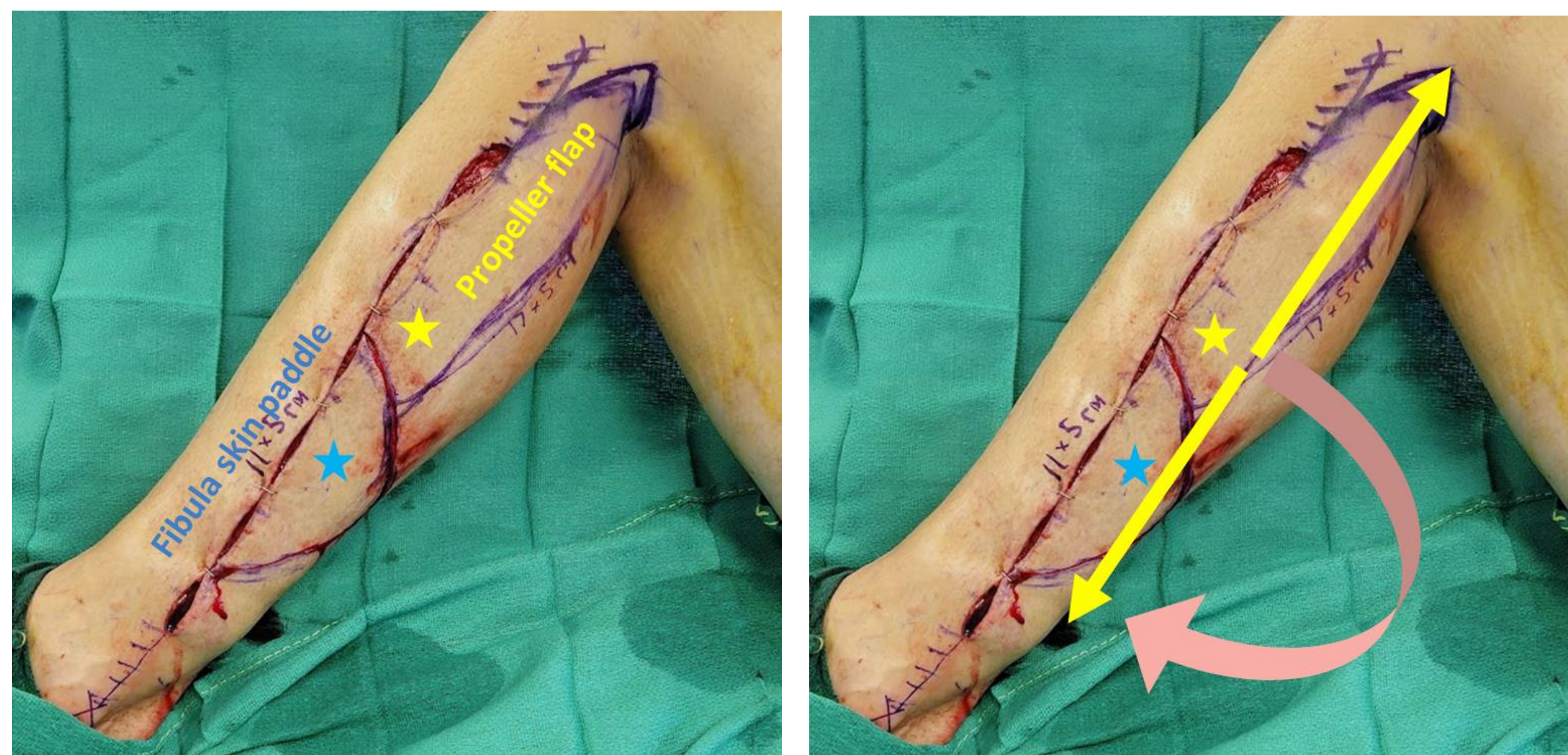
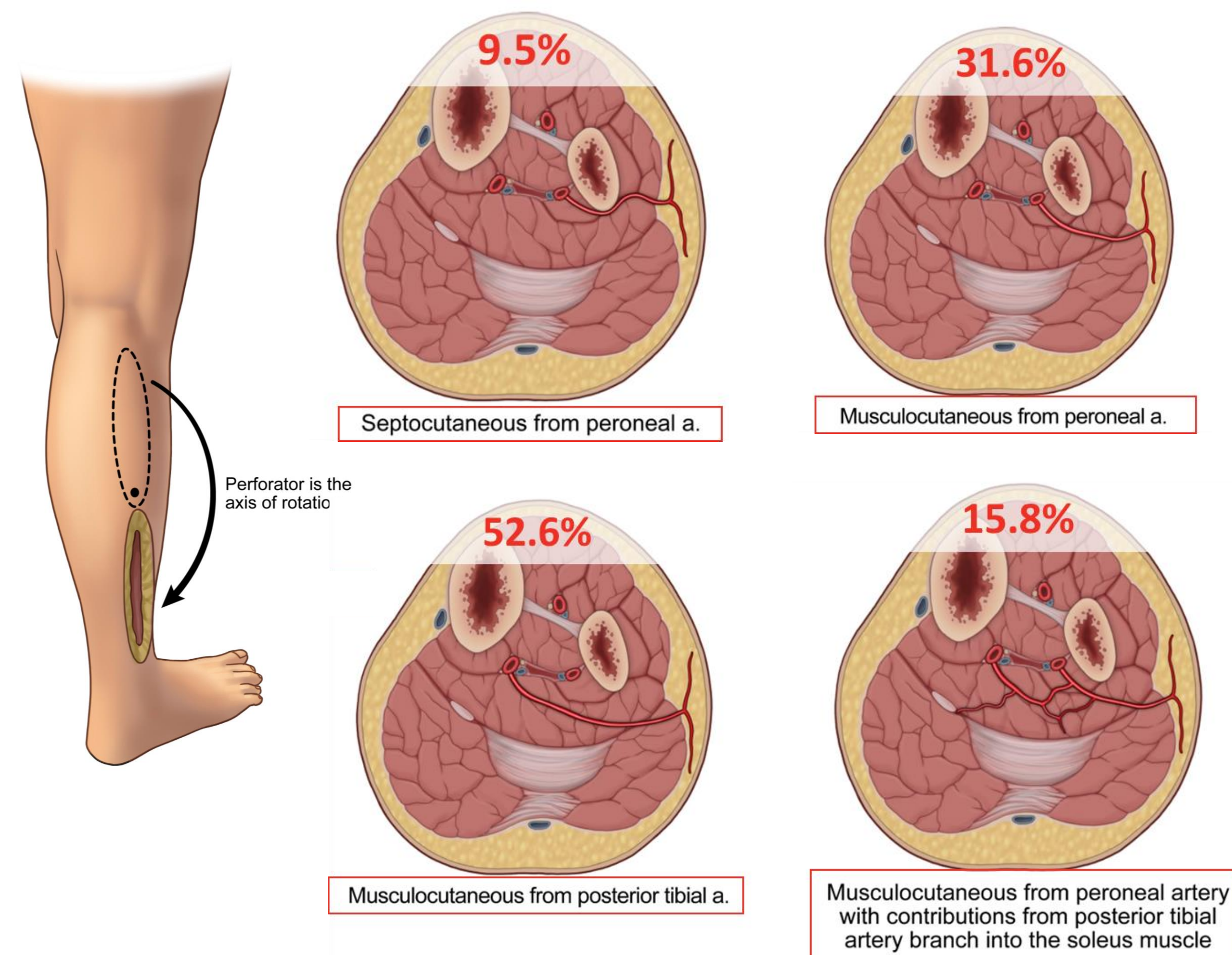


Figure 2. Anatomical variations of the origin of the proximal P perforator

The proximal P perforator can receive contributions from both the peroneal and posterior tibial system via the soleus muscle. The feasibility of performing a tonearm flap is determined by confirming an audible signal at the level of the fascia and the skin after the peroneal vessels are harvested with the OCFFF.



## RESULTS

Table 1. Patient Characteristics

|                                         | Propeller flap | Skin graft closure | p             |
|-----------------------------------------|----------------|--------------------|---------------|
|                                         | <b>N=21</b>    | <b>N=195</b>       |               |
| <b>Demographics</b>                     |                |                    |               |
| Age, mean +/- SD                        | 63.5 ± 12.49   | 62.2 ± 13.24       | 0.67          |
| BMI, mean +/- SD                        | 26.3 ± 4.46    | 26.8 ± 5.81        | 0.68          |
| Mean length of follow-up, months +/- SD | 18.6 ± 7.87    | 19.4 ± 9.94        | 0.97          |
| Gender (%)                              |                |                    | 0.296         |
| Male                                    | 16 (76.2)      | 127 (65.1)         |               |
| Female                                  | 5 (23.8)       | 68 (34.9)          |               |
| <b>Comorbid conditions</b>              |                |                    |               |
| Obesity                                 | 4 (20)         | 46 (23.6)          | 0.718         |
| Hypertension                            | 7 (33.3)       | 115 (59.0)         | <b>0.024*</b> |
| Diabetes mellitus                       | 4 (19.0)       | 35 (17.9)          | 0.901         |
| Coronary artery disease                 | 5 (23.8)       | 23 (11.8)          | 0.116         |
| Peripheral vascular disease             | 3 (14.3)       | 12 (6.2)           | 0.151         |
| Active smoker                           | 3 (14.3)       | 41 (18.2)          | 0.653         |

Table 2: Surgical Details for Propeller Flaps

|                                                         |                                                                                                |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Average defect size                                     | 69.9 ± 28.26 cm <sup>2</sup>                                                                   |
| Average propeller flap size                             | 80.3 ± 26.20 cm <sup>2</sup>                                                                   |
| Location of propeller perforator (cm from fibular head) | 13.4 ± 2.00 cm <sup>2</sup>                                                                    |
| Complications                                           | 3 patients required distal partial flap loss (all less than 3x3 cm) requiring local wound care |

Table 3: Skin Graft Closure Data

|                                                         |                                                                                                |
|---------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Average defect size                                     | 69.9 ± 28.26 cm <sup>2</sup>                                                                   |
| Average propeller flap size                             | 80.3 ± 26.20 cm <sup>2</sup>                                                                   |
| Location of propeller perforator (cm from fibular head) | 13.4 ± 2.00 cm <sup>2</sup>                                                                    |
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## CONCLUSIONS

Local propeller flaps can be utilized with reasonable success and has potential benefits over traditional skin graft closures.

Anatomy of the proximal perforator is highly variable and requires intraoperative exploration for appropriate flap design.



## REFERENCES

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