Phalloplasty Flap-Related Complication

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KEYWORDS

• Phalloplasty • Complications • Radial forearm free flap phalloplasty • Transgender

KEY POINTS

- Phalloplasty is a subset of 8 different procedures and with each of them comes its own set of complications.
- It is, therefore, important to understand how each of those complications affects the outcome of the other procedures and how to best stage them and to deal with complications when they occur.
- More than almost any other procedure in plastic surgery, both surgeon and patient have to understand the particularities of this reconstruction to both prepare for success and deal with complications if they arise.

INTRODUCTION

The male and female genital structures share a common embryologic origin. This principle has been masterfully utilized for vaginoplasty and metoidioplasty. Unfortunately, when creating a phallus, this concept can be only partially applied because the size mismatch between the analogous structures is insufficient. To create an anatomic phallus, reconstructive principles ranging from locoregional to distant tissue transfer need to be applied. The earliest attempts at phalloplasty used tubed groin and abdominally based flaps. Although these flaps allowed for creation of a shaft, they lacked a conduit for the urinary stream. Techniques for urethral reconstruction emerged with the creation of a neourethra within the tissue used for phallic construction.[1,2] Because the native urethra emerges at a low, unfavorable angle, there was also a need for procedures allowing the native urethra to be lengthened to reach the neophallic shaft urethra.[3,4] With the advent of microsurgery in the 1970s, reconstructive options expanded, and thinner more pliable tissue for urethral reconstruction was identified on the forearm. Chang and Hwang[5] were the first to describe the radial forearm free flap phalloplasty (RFFFP) with the tube-in-tube concept in 1984. This novel concept allowed for the use of 1 single distant flap to create both a shaft and a neourethra from the same tissue. The RFFFP technique remains one of the most frequently used flaps for total phallic reconstruction. Using microsurgical techniques, surgeons from all over the world started experimenting with various flaps through the 1980s and 1990s in search of a perfect flap for a functional and aesthetic phallic reconstruction (**Fig. 1**). Incorporating fibular or radial bone was popular for a while but, due to bone resorption, donor site morbidity, and erosion, this is less commonly used. The newest addition with current widespread utilization is the anterolateral thigh (ALT) flap, which can be used as a tube-in-tube concept or as a shaft-only option.

This article outlines some of the most frequently encountered flap-related complications as they

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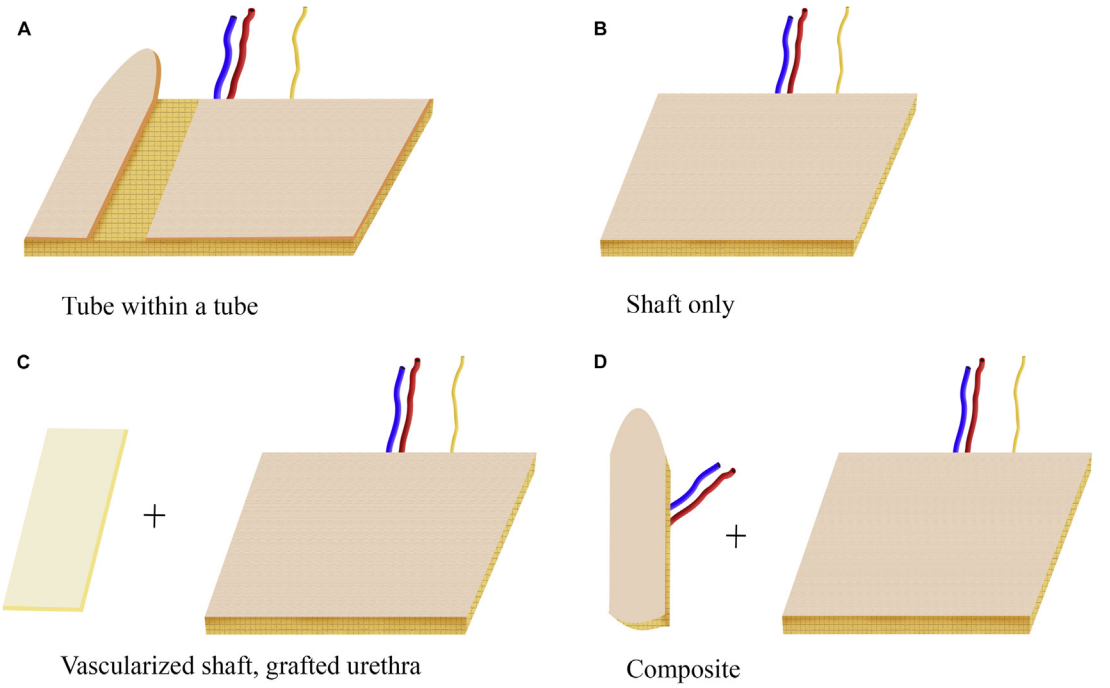

Fig. 1. Frequently used reconstructive principles in phalloplasty. (*A*) Tube within a tube design (*B*) Shaft reconstruction only (ie, no neourethra) (*C*) Vascularized shaft with graft used for urethral lining (*D*) Composite reconstruction with vascularized flaps for both shaft and urethra.

apply to each donor sites and particular staging of the phalloplasty creation.

DONOR SITES

Phalloplasty is known for its high rate of complications, and although surgeons are still searching for new ways of performing this procedure, only the most commonly used donor sites are the focus of this article. It is important to understand that any given donor site can be used in various ways depending on patient anatomy and surgeon preference (**Table 1**). This fact makes any systematic review on this topic nearly impossible and there are insufficient data to support one procedure over another.

Irrespective of flap choice, phalloplasty unfortunately does not have one single "Achilles heel" but battles a hydra of adverse circumstances:

- Flap design that includes tubularization of tissue (1–2 times) with an associated increased risk for ischemia
- Dependent, unstable position
- Colonized, moist recipient site
- Area of major friction during ambulation
- Acting as urinary conduit

Readers are referred to other literature in regard to harvesting technique and potential pitfalls. Patient selection, however, is an important factor in mitigating complications (eg, smoking history, body mass index [BMI], diabetes, and age). Aside from counseling for smoking cessation or improving diabetic control, there are no objective data to guide the risk profile of any given patient. Similarly, obesity is a relative contraindication for phalloplasty not only due to the resulting phallic dimensions but also relating to the technical challenges and postoperative risks of flap loss. Again, there are no reliable data to guide management. BMI may not be the best way to assess for risk, because skin laxity and body fat distribution are more important considerations than absolute BMI value. At the authors' institution, there is not a firm BMI cutoff for offering surgery but a belief that a BMI less than 30 is ideal, and patients are counseled to attempt weight loss to meet this goal. The authors, however, have successfully performed phallic reconstructions in patients with a BMI of 37. These individual circumstances require good counseling with patients regarding their increased risk for flap failure in the postoperative period. Patients are highly motivated to undergo this procedure and are able to lose considerable amount of weight. They should be informed that massive weight loss may necessitate excision of excess skin before they become candidates for surgery.

Complications in phalloplasty are unfortunately common and can quickly unravel an otherwise