Donor Site Morbidity in Phalloplasty Reconstructions: Outcomes of the Radial Forearm Free Flap

- Phalloplasty:
  Surgical procedure where a penis is created

- Who needs phalloplasty?
  Female-to-male (FTM) gender confirmation, ambiguous genitalia, aphalasia, epispadias, hypospadias, micropenis, trauma to the penis

- Procedure:
  Creation of the penis, lengthening the urethra, creating glans, creation of the scrotum, removal of the vagina, placing erectile and testicular implants

- Donor sites:
  - Radial forearm free flaps: excellent cosmetic results and better sensation
  - Anterolateral thigh free flaps: you more penis length options. Scars on the thigh easier to hide
  - Latissimus dorsi flaps: less scar. Best potential for an erection without a device.
  - Factors that indicate which donor site is used include patient’s health, fat distribution, nerve functionality, blood flow, patient goals, desired surgical outcomes

- Results/ Conclusions
  The most common indication for surgery: gender affirmation 77.7% (n=730)
  Other indications: trauma/ oncologic injury (n=32), bladder or cloacal exstrophy (n=26), and agenesis/aplasia (n=8)
  RFFF sizes: 4×17 cm²–16×16 cm², average 167 cm²
  Overall complication rate: 7.9% (74/940)
  Donor site complications: infection, hematoma, dehiscence, neuroma formation, nerve compression/compartment syndrome, skin graft failure, decreased, strength/sensation, lymphedema/swelling, and contracture

  - Most commonly reported complications: skin graft failure (8/10), decreased strength/sensation (6/10)
  - In comparison with other reconstructive applications of the RFFF, phalloplasty does not seem to increase the comparative rate of complications, despite utilizing much larger flaps.
  - Surgeons and patients should thoroughly discuss the flap options for genital reconstruction and compare the phallus outcomes with the donor site morbidity to determine the appropriate surgical plan for the patient

Table 1. Included Study Cohort Average Age, Follow-Up, Indication for Surgery

| Author | Year | Patients | Age | Follow-Up | Gender Confirmation | Trauma / Oncologic / Medical | Bladder / Cloacal Exstrophy | Agenesis / Aplasia |
|--------|------|----------|-----|-----------|---------------------|-----------------------------|-----------------------------|------------------|
| Selvaggi et al | 2006 | 125 | 43 (6-108) | 125 | 3 | 4 |
| Monroy et al | 2009 | 207 | 43 (7-101) | 207 | 5 | 5 |
| Garaffa et al | 2009 | 15 | 43.6 (39-54) | 15 | 15 | 15 |
| Garaffa et al | 2011 | 115 | 43.9 (20-55) | 115 | | |
| Garaffa et al | 2010 | 17 | 48.4 (30-55) | 17 | 9.2 (1-32) | |
| Deonard et al | 2011 | 516 | 48 (30-66) | 516 | 306 | 4 |
| Song et al | 2011 | 16 | 53 (3-60) | 16 | 12 |
| Messani et al | 2013 | 16 | 12 (2-52) | 16 | | |
| Garaffa et al | 2014 | 16 | 53.63 (9-28) | 16 | | |
| Falcone et al | 2016 | 10 | 36 (27-50) | 10 | | |

Table 2. Donor Site Complications by Article

| Author | Year | Patients | Infection | Hematoma | Dehiscence | Neurapathy | Nerve Compression/ Compartment Syndrome | Skin Graft Failure | Decreased Strength/ Sensation | Lymphedema / Swelling | Contracture |
|--------|------|----------|-----------|----------|------------|-----------|----------------------------------------|------------------|-----------------------------|----------------------|------------|
| Selvaggi et al | 2006 | 125 | 1 (0.8%) | 1 (0.8%) | 1 (0.8%) | 1 (0.8%) | 1 (0.8%) | 1 (0.8%) | 1 (0.8%) | 1 (0.8%) | 1 (0.8%) |
| Monroy et al | 2009 | 207 | 1 (0.5%) | 1 (0.5%) | 1 (0.5%) | 1 (0.5%) | 1 (0.5%) | 1 (0.5%) | 1 (0.5%) | 1 (0.5%) | 1 (0.5%) |
| Garaffa et al | 2009 | 15 | 1 (6.7%) | 1 (6.7%) | 1 (6.7%) | 1 (6.7%) | 1 (6.7%) | 1 (6.7%) | 1 (6.7%) | 1 (6.7%) | 1 (6.7%) |
| Garaffa et al | 2010 | 115 | 1 (0.9%) | 1 (0.9%) | 1 (0.9%) | 1 (0.9%) | 1 (0.9%) | 1 (0.9%) | 1 (0.9%) | 1 (0.9%) | 1 (0.9%) |
| Garaffa et al | 2010 | 17 | 3 (17.6%) | 3 (17.6%) | 3 (17.6%) | 3 (17.6%) | 3 (17.6%) | 3 (17.6%) | 3 (17.6%) | 3 (17.6%) | 3 (17.6%) |
| Deonard et al | 2011 | 516 | 1 (0.2%) | 1 (0.2%) | 1 (0.2%) | 1 (0.2%) | 1 (0.2%) | 1 (0.2%) | 1 (0.2%) | 1 (0.2%) | 1 (0.2%) |
| Song et al | 2011 | 16 | 3 (18.8%) | 3 (18.8%) | 3 (18.8%) | 3 (18.8%) | 3 (18.8%) | 3 (18.8%) | 3 (18.8%) | 3 (18.8%) | 3 (18.8%) |
| Messani et al | 2013 | 16 | 1 (6.3%) | 1 (6.3%) | 1 (6.3%) | 1 (6.3%) | 1 (6.3%) | 1 (6.3%) | 1 (6.3%) | 1 (6.3%) | 1 (6.3%) |
| Garaffa et al | 2014 | 16 | 1 (6.3%) | 1 (6.3%) | 1 (6.3%) | 1 (6.3%) | 1 (6.3%) | 1 (6.3%) | 1 (6.3%) | 1 (6.3%) | 1 (6.3%) |
| Falcone et al | 2016 | 10 | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) | 0 (0%) |