



BACKGROUND

- Robotic-assisted surgical systems have expanded applications across multiple surgical specialties, including plastic and reconstructive surgery.
- In plastic and reconstructive surgery, robotics may be especially valuable for free tissue transfer and microsurgical reconstruction.
- Because these systems are still novel, their feasibility, safety, and clinical utility in free tissue transfer remain incompletely defined.
- **Study Aim:** To present our prospective institutional experience and findings from the first 53 cases of robotic-assisted microsurgery performed using the Symani Surgical System.

METHODS

- Study Design: Retrospective cohort review of all patients undergoing microsurgical free flap reconstruction with the Symani Surgical System.
- Study Period: October 2024 to April 2026.
- Data collected from electronic health record:
 - Patient demographics
 - Operative variables
 - Post-operative outcomes
- Analysis: Descriptive statistics performed using RStudio (Version 2023.06.2).

RESULTS

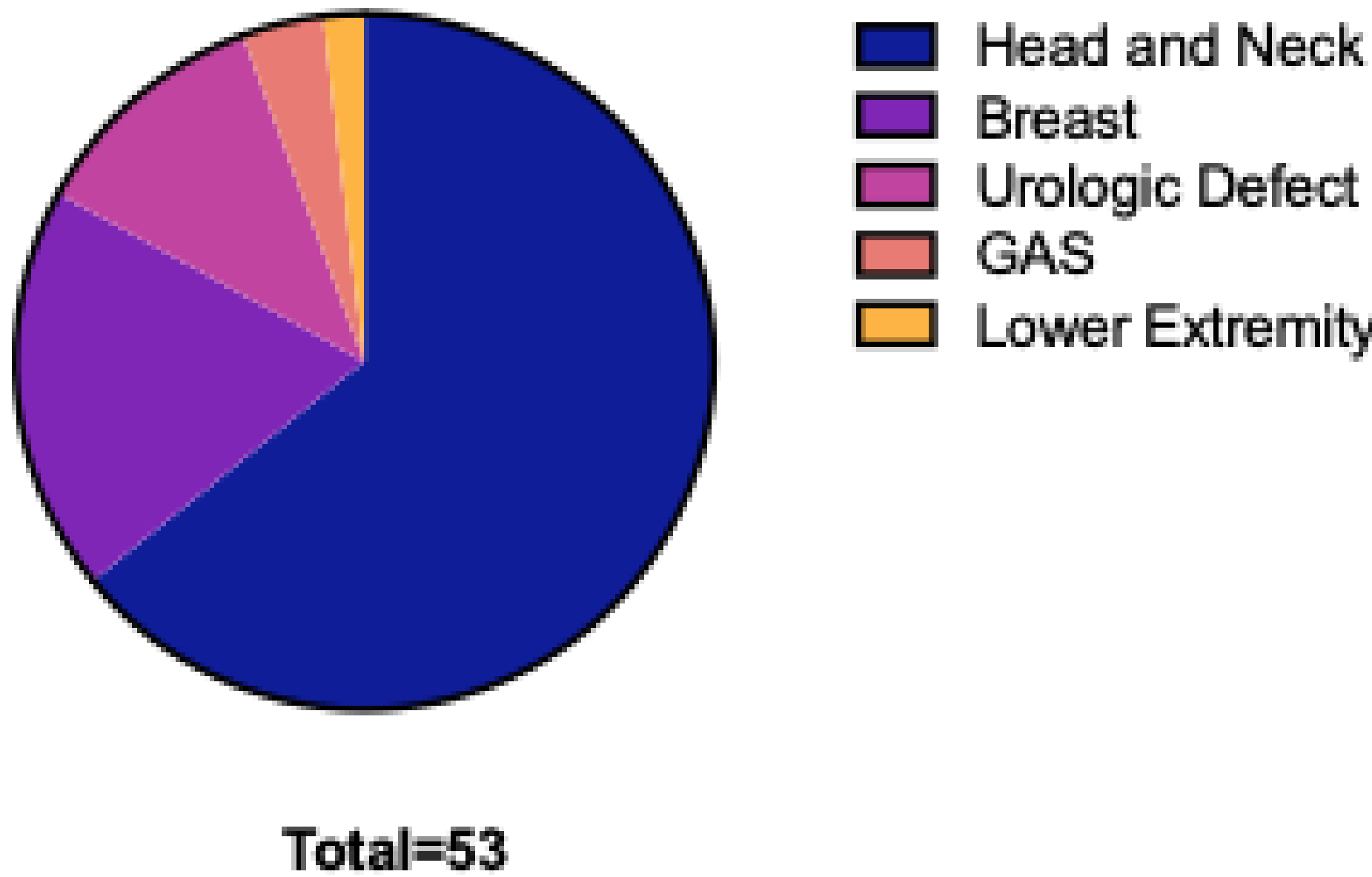


Figure 1: Distribution of surgical indications for robotic-assisted microsurgery

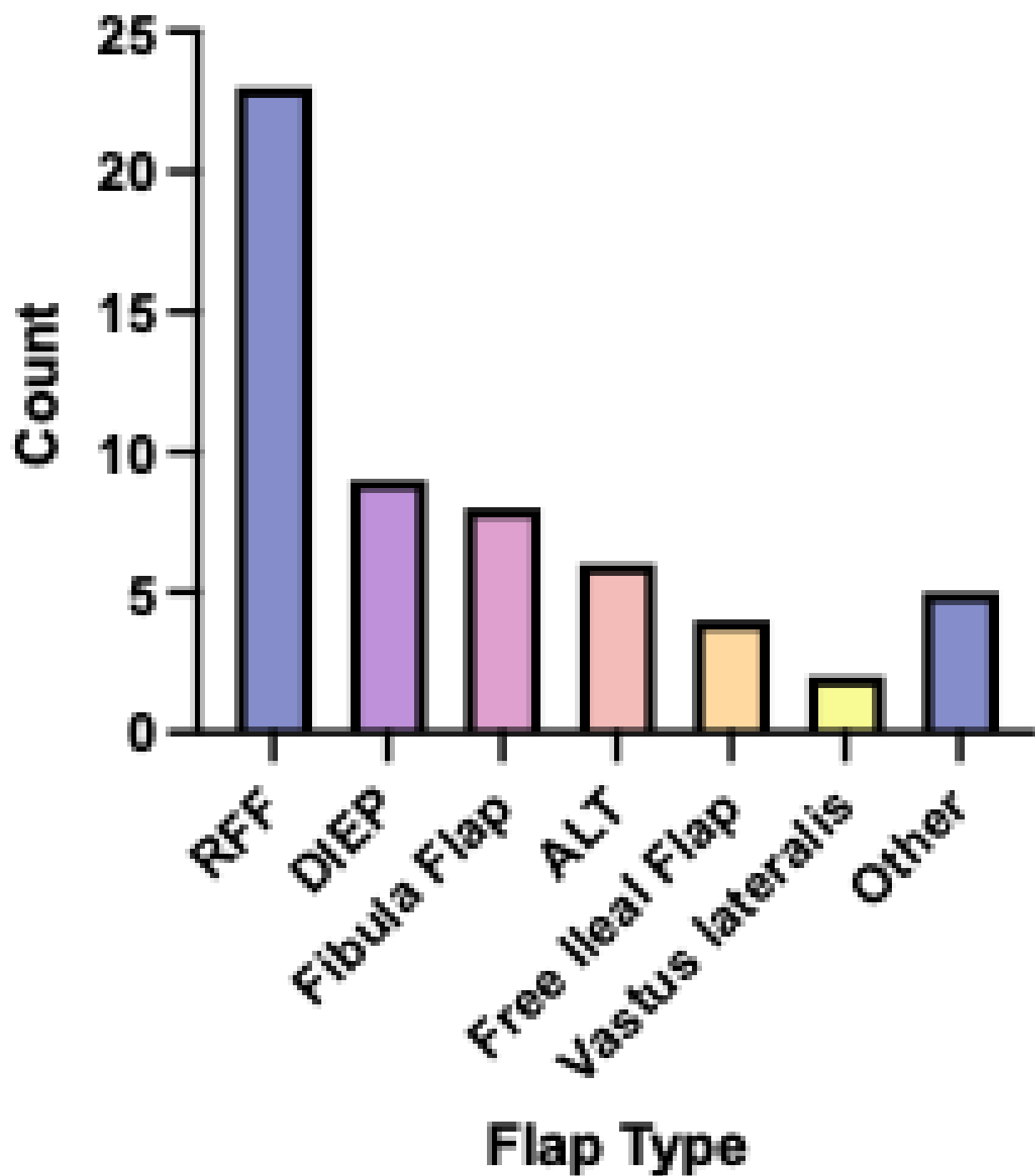


Figure 2: Distribution of flap types completed with robotic-assisted microsurgery

Total Number of Anastomoses/Coaptations			N (%)
Arterial	61		
Robot Sewn			38 (62.3)
Hand Sewn			23 (37.7)
Venous	75		
Coupler			49 (65.3)
Robot Sewn			24 (32)
Partial			2 (2.7)
Nerve	7		
Robot Sewn			5 (71.4)
Hand Sewn			1 (14.3)
Partial			1 (14.3)
Operative Time (mins)			597.5 (SD 151.9)

Any Post-Operative Complication	N (%)
Donor Site	
Dehiscence	3 (5.7)
Seroma	2 (3.8)
SSI	1 (1.9)
Skin Graft Site Breakdown	1 (1.9)
Small Bowel Obstruction	1 (1.9)
Flap	
SSI	5 (9.4)
Ischemia	2 (3.8)
Dehiscence	2 (3.8)
Partial Necrosis	2 (3.8)
Seroma	2 (3.8)
Hematoma	1 (1.9)
Venous Congestion	1 (1.9)
Other	1 (1.9)

RESULTS

- 53 patients underwent robotic-assisted microsurgery using the Symani Surgical System
- Mean age: 60.1 ± 13.5 years;
- Gender: 52.8% female
- Mean operative time: 597.5 ± 151.9 minutes.
- 143 total microsurgical anastomoses performed
- Postoperative outcomes:
 - Surgical site infection: 11.3%
 - Reoperation: 6 patients (9 total procedures)
 - Readmission: 5 patients

CONCLUSION

- Robotic-assisted free tissue transfer shows promise as an additional tool for microsurgeons.
- This early series supports the feasibility of robotic use in microsurgical anastomosis and nerve coaptation.
- Successful use across multiple surgical indications, and flap types suggests broad microsurgical applicability
- Acceptable early outcomes support safe integration in selected patients
- Potential advantages include greater precision, tremor reduction, and improved ergonomics.
- Further study is needed to assess efficiency, cost, learning curve, and long-term outcomes.