

## Robotic assisted free flap reconstruction of the scalp using the Symani® Surgical System

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**Background:** Robotic surgery has developed as a new opportunity with potential benefits for reconstructive surgery. The Symani® Surgical system (Medical Microinstruments, Jacksonville, Florida, USA) has shown feasibility in performing microsurgical anastomosis. First-time transplantation of a free-flap using the Symani® Surgical System for microsurgical anastomosis was presented in 2023. Soft tissue defects of the scalp have different etiologies; neoplasms, intracranial vascular pathologies and trauma with following neurosurgical procedures are the most common. Most commonly healthy tissue is needed for reconstruction of the defect. We describe our experience with free soft tissue transfer with a free Anterolateral thigh (ALT) flap or free Latissimus dorsi (LD) flap for reconstruction of the scalp using the Symani® Surgical System for microsurgical anastomosis

**Results:** 5 male patients and 2 female patients (age 61-81 years, mean 72.1 years) were included. Mean hospital stay was 10 (8-13) days. The most common recipient vessels were the Superficial temporal artery and vein (57%). In other cases we used the facial artery and vein. All arterial anastomosis were performed by using the Symani robotic system. The mean operative time was 412 minutes. The mean anastomosis time using the Symani® Surgical System was 36 minutes. No complications and no flap loss were observed.



Figure 1. The Symani® Surgical System is a flexible platform consisting of two robotic arms that can be easily positioned to facilitate surgical procedures across any anatomical region.



A)

The Symani® Surgical System is used with an exoscope for visualization. The surgeons use the Joysticks to direct the robotic arms without the necessity standing next to the surgical field. Via monitor the entire operating team can follow the surgery. A) and B) If assistance was needed this could be easily provided by an assisting surgeon from the side of the operating table opposite to the Symani® Surgical System. C)



B)

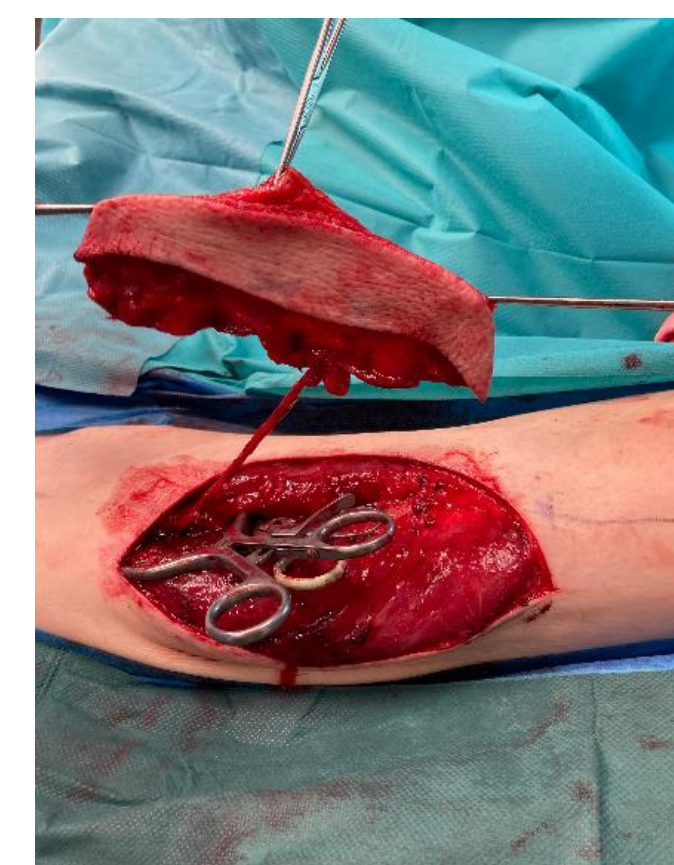


C)

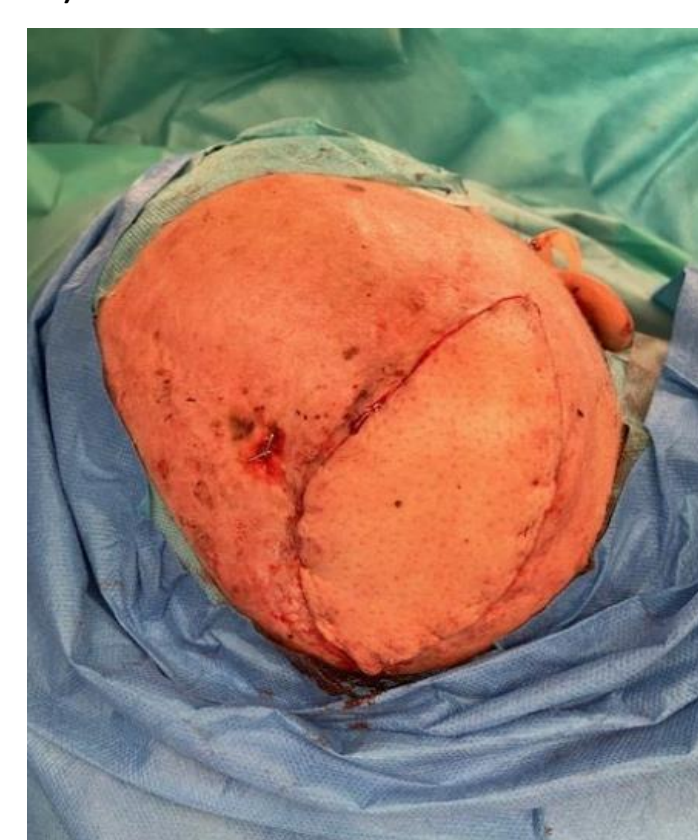
**Methods:** We analyzed 7 patients with soft tissue defects of the scalp from September 2023 to February 2024. Every patient underwent soft tissue reconstruction with a free ALT or LD flap. The microsurgical anastomosis was always performed by using the Symani® Surgical System.



A)



B)



C)



D)

74y old patient with metastasis of a pleomorphic sarcoma of the scalp. The patient underwent R0 excision of the tumor with Palacos plastic occipital and saggital sinus reconstruction. A free ALT-flap from the right leg was used to reconstruct the defect. As donor artery we used the Superficial temporal artery. Followed by post-operative radiotherapy. A) Intra-operative view B) and C) ALT flap tailoring. D) 3-months follow up.

**Conclusions:** For reconstruction of soft tissue defects of the scalp, a free ALT or LD flap represents a proper treatment option. Performing microanastomosis using the Symani® Surgical System is a safe technology and is leading to satisfactory outcomes.