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Research & Publications

JANUARY 2026

Robotic-assisted Lymphatic Surpermicrosurgery for Breast Lymphedema—a Case Report and Literature Review

Authors:

Struebing F, Weigel J, Gazyakan E, Siegwart LC, Holup C, Kneser U, Boecker AH

Annals of Plastic Surgery

Published April 2025

Robot-assisted Microsurgery Has a Steeper Learning Curve in Microsurgical Novices

Authors:

Struebing F, Weigel J, Gazyakan E, Siegwart LC, Holup C, Kneser U, Boecker, AH

Life

Published May 2025

Evaluating the Utility of Robotic Systems in Plastic and Reconstructive Surgery: A Systematic Review

Authors:

Seth I, Lim K, Chang E, Rozen WM, and Ng S. K.-H.

Sensors

Published May 2025

Simulation and Comparison of Objectively Graded Microsurgery Steps by Using a Microscope and Symani Robotic System by Young Professionals

Authors:

Wieker H, Brandenburg N, Spille D, et al.

Journal of Robotic Surgery

Published June 2025

Head & Neck Free Flap Reconstruction: A Prospective Case Series with the Symani Surgical System

Authors:

Spille J, Wiltfang J, Wieker H

Journal of Cranio-Maxillofacial Surgery

Published September 2025

Robotic-assisted Free Flap Reconstruction of the Scalp using the Symani Surgical System

Authors:

Watson JA, Könniker S, Esposito G, Hofmann L, Kim BS, Giovanoli P, and Lindenblatt N

Acta Neurochirurgica

Published March 2025

Advances in Reconstructive Robotic Microsurgery in the Extremity

Authors:

Könniker S, Watson JA, Weinzierl A, von Reibnitz D, Besmens I, Kim BS, Giovanoli P, and Lindenblatt N

The Journal of Craniofacial Surgery

Published January 2025

Implementation Strategies and Ergonomic Factors in Robot-assisted Microsurgery

Authors:

Struebing F, Gazyakan E, Bigdeli AK, Vollbach FH, Weigel J, Kneser U, and Boecker A

Journal of Robotic Surgery

Published January 2025

Ergonomic Considerations in Robotic-assisted Microsurgery

Authors:

Struebing F, Kneser U, Bigdeli AK, Gazyakan E, Weigel J, Vollbach FH, and Boecker A

Journal of Craniofacial Surgery

Published January 2025





Robotic-assisted Microsurgery: A Single-Center Experience of 100 Cases

Authors:

Struebing F, Boecker A, Vollbach F, Weigel J, Kneser U, Bigdeli AK, and Gazyakan E

Journal of Robotic Surgery

Published December 2024

Hands-on Robotic Microsurgery: Robotic-assisted Free Flap Reconstruction of the Upper Extremity

Authors:

Struebing F, Boecker A, Weigel J, Kneser U, Bigdeli AK, and Gazyakan E

Journal of Clinical Medicine

Published December 2024

Robotic Microsurgery for Pediatric Peripheral Nerve Surgery

Authors:

Schäfer B, Freund G, Bahm J, and Beier JP

Journal of Robotic Surgery

Published October 2024

Fully Telemetric Robotic Microsurgery: Clinical Experience with 23 Cases

Authors:

Gorji S, Wessel K, Dermietzel A, Aitzetmueller M, Wendenburg I, Varnava C, Klietz ML, Wiebringhaus P, Hirsch T, and Kückelhaus M

Microsurgery

Published September 2024

Robotic-assisted Lymphovenous Anastomosis of the Central Lymphatic System

Authors:

Grünherz L, Weinzierl A, Gutschow CA, et al.

Plastic & Reconstructive Surgery – Global Open

Published September 2024

The Use of the Symani Surgical System® in Emergency Hand Trauma Care

Authors:

Dastagir N, Obed D, Tamulevicius M, Dastagir K, Vogt PM

Surgical Innovation

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Minimally Invasive Robotic-assisted Perforator-to-Perforator DIEP Flap Breast Reconstruction

Authors:

Kückelhaus M.

Plastic & Reconstructive Surgery – Global Open

Published May 2024

100 Anastomoses: a Two-Year Single-Center Experience with Robotic-assisted Micro- and Supermicrosurgery for Lymphatic Reconstruction

Authors:

von Reibnitz D, Weinzierl A, Barbon C, et al.

Journal of Robotic Surgery

Published April 2024

Robot-assisted Microsurgery: Lessons Learned from 50 Consecutive Cases

Authors:

Struebing F, Bigdeli A, Weigel J, et al.

Plastic & Reconstructive Surgery – Global Open

Published March 2024





First Series of Free Flap Reconstruction Using a Dedicated Robotic System in a Multidisciplinary Microsurgical Center

Authors:

Beier JP, Hackenberg S, Boos AM, Modabber A, Duong Dinh TA, Hölzle F.

Plastic & Reconstructive Surgery–Global Open

Published September 2023

Benefits of Robotic-assisted Lymphatic Microsurgery in Deep Anatomical Planes

Authors:

Weinzierl A, Barbon C, Gousopoulos E, et al.

JPRAS Open

Published July 2023

Exploring the Learning Curve of a New Robotic Microsurgical System for Microsurgery

Authors:

Barbon C, Grünherz L, Uyulmaz S, Giovanoli P, Lindenblatt N.

JPRAS Open

Published December 2022

Early Experience Using a New Robotic Microsurgical System for Lymphatic Surgery

Authors:

Lindenblatt N, Grünherz L, Wang A, et al.

Plastic & Reconstructive Surgery–Global Open

Published January 2022





Further Validating the Robotic Microsurgery Platform through Preclinical Studies on Rat Femoral Artery and Vein

Authors:

Cho J, Kim D, Kim T, Pak CJ, Suh HP, Hong JP.

Journal of Reconstructive Microsurgery

Published January 2025

Learning Curve of Robotic-assisted Microsurgery in Surgeons with Different Skill Levels: A Prospective Preclinical Study

Authors:

von Reibnitz D, Weinzierl A, Grünherz L, Giovanoli P, Lindenblatt N.

Journal of Robotic Surgery

Published September 2024

Ideal Suturing Technique for Robot-assisted Microsurgical Anastomoses

Authors:

Wessel KJ, Wendenburg I, Varnava C, et al.

Journal of Robotic Surgery

Published June 2024

Safety and Efficacy of Symani Robotic-assisted Microsurgery: Assessment of Vascular Anastomosis Patency, Thrombus, and Stenosis in a Randomized Preclinical Study

Authors:

Menichini G, Malzone G, Tamburello S, et al.

Journal of Plastic, Reconstructive & Aesthetic Surgery

Published June 2024

Preclinical Performance of the Combined Application of Two Robotic Systems in Microsurgery: A Two-center Study

Authors:

Wessel KJ, Stögner VA, Yu CT, et al.

Plastic & Reconstructive Surgery-Global Open

Published April 2024

Combined Application of a Novel Robotic System and Exoscope for Microsurgical Anastomoses: Preclinical Performance

Authors:

Wessel KJ, Wendenburg I, Shaghayegh Gorji, et al.

Journal of Reconstructive Microsurgery-Global Open

Published November 2023

Microsurgical Robotic System Enables the Performance of Microvascular Anastomoses: A Randomized In Vivo Preclinical Trial

Authors:

Malzone G, Menichini G, Innocenti M, et al.

Scientific Reports – A Journal of the Nature family

Published August 2023

New Robotic System with Wristed Microinstruments Allows Precise Reconstructive Microsurgery: Preclinical Study

Authors:

Ballestín A, Malzone G, Menichini G, Lucattelli E, Innocenti M.

Annals of Surgical Oncology

Published June 2022



Robot-assisted Lymphovenous Anastomosis Surgery for Lymphocele in the Groin

Authors:

Lilja C, Thomsen JB, Sørensen JA.

BMJ Case Reports

Published May 2024

Using a Microsurgical Robotic Platform for In-flap Anastomosis in Autologous Bipedicular Breast Reconstruction

Authors:

Vollbach FH, Bigdeli AK, Struebing F, Weigel JL, Gazyakan E, Kneser U.

Plastic & Reconstructive Surgery–Global Open

Published January 2024

First-in-human Use of a Microsurgical Robotic System for Central Lymphatic Reconstruction

Authors:

Grünherz L, Weinzierl A, Puipe GD, et al.

Plastic & Reconstructive Surgery–Global Open –

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Nerve Transfers Using a Dedicated Microsurgical Robotic System

Authors:

Schäfer B, Bahm J, Beier JP.

Plastic & Reconstructive Surgery–Global Open

Published August 2023

First-in-Human Free-Flap Tissue Reconstruction Using a Dedicated Microsurgical Robotic Platform

Authors:

Innocenti M, Malzone G, Menichini G.

Plastic & Reconstructive Surgery

Published May 2022

**Clinical Experience in Open
Robotic-assisted Microsurgery:
User Consensus of the European
Federation of Societies for
Microsurgery**

Authors:

Kückelhaus M, Nistor A, van Mulken T, et al.

Journal of Robotic Surgery

Published April 2025

**Feasibility Study to Evaluate the
MMI Symani Robotic System for
Microsurgical Techniques in an In-
vitro Circulation Model**

Authors:

Rusch M, Hoffmann G, Berndt R, Rusch R.

*Journal of Vascular Surgery Cases, Innovations
and Techniques*

Published March 2025

**Robotic-assisted Microsurgery in
Gender-Affirming Phalloplasty**

Authors:

Wellenbrock S, Ozturk M, Sohn M, et al.

Annals of Plastic Surgery

Published January 2025

**Evaluation of the MMI Symani®
Robotic Microsurgical System for
Coronary-bypass Anastomoses in a
Cadaveric Porcine Model**

Authors:

Rusch M, Hoffmann G, Wieker H, et al.

Journal of Robotic Surgery

Published April 2024

**A Technical Feasibility Study on
Adaptation of a Microsurgical
Robotic System to an Intraoperative
Complication Management in
Dental Implantology: Perforated
Schneiderian Membrane Repair Using
Symani® Surgical System**

Authors:

Wieker H, Hinrichs C, Retzlaff M, et al.

Journal of Robotic Surgery

Published October 2023

**A Novel Microsurgical Robot:
Preliminary Feasibility Test in
Ophthalmic Field**

Authors:

Savastano A, Rizzo S.

*Translational Vision Science & Technology
(TVST) ARVO Journal*

Published August 2022



Brain Drain for Brain Gain: Potential Applications of Robotic-assisted Lymphatic Microsurgery in the Management of Neurological Disorders

Authors:

Watson JA, Knoedler S, von Reibnitz D, et al.

Plastic & Reconstructive Surgery–Global Open

Published October 2025

Robotic-assisted Lymphovenous Anastomosis: A Systematic Review of Surgical Outcomes

Authors:

Suat Morkuzu, Ozmen BB, Ceyda Buyuker, et al.

Microsurgery

Published November 2025

Exploring the Use of Robotics in Reconstructive and Plastic Surgery: A Comprehensive Perspective

Authors:

AlKarboli Y, Abara N, Alotaibi A, et al.

Cureus

Published November 2025

New Technology to Facilitate Microvascular Anastomosis: the Perspective of the Aging Microsurgeon

Authors:

Levin LS

Orthoplastic Surgery

Published March 2025

Recent Advancements in Robotic-assisted Plastic Surgery Procedures: A Systematic Review

Authors:

Kawashima K, Ghali S, Nikkhah D, Esmaeili A.

Plastic & Reconstructive Surgery–Global Open

Published January 2025

The Use of Robotic Surgery in Plastic and Reconstructive Surgery: A Narrative Review

Authors:

Novo J, Seth I, Mon Y, et al.

Bioimetrics

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Expanding Applications and Future of Robotic Microsurgery

Authors:

Wessel KJ, Dahmann S, Kückelhaus M.

The Journal of Craniofacial Surgery

Published January 2025

Robotic-assisted Lymphedema Surgery: Bridging the Gap in Training and Expanding Complex Surgical Options

Authors:

Levin LS, Payne MM, Van Vleet JD, Azoury SC.

The Journal of Craniofacial Surgery

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Robotic-assisted Microsurgery in Lymphatic Reconstruction

Authors:

Stögner VA, Pucciarelli DM, Pomahac B, Ayyala HS.

The Journal of Craniofacial Surgery –

Published January 2025





Robotic Microsurgery: Past, Present, Future

Authors:

Levin LS, Azoury SC.

The Journal of Craniofacial Surgery –

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Comparative Evaluation of Major Robotic Systems in Microanastomosis Procedures: A Systematic Review of Current Capabilities and Future Potential

Authors:

Cannizzaro D, Scalise M, Zancanella C, Paulli S, Peron S, Stefini R.

Brain Sciences

Published December 2024

Clinical, Preclinical and Educational Applications of Robotic Assisted Flap Reconstruction and Microsurgery: A Systematic Review

Authors:

Awad L, Bollen E, Reed B, Langridge BJ, Jasionowska S, Nikkhah D, Butler PEM, Ponniah A

Microsurgery –

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Advances in Modern Microsurgery

Authors:

Thamm OC, Eschborn J, Schäfer RC, Schmidt J.

Journal of Clinical Medicine

Published September 2024

Systematic Review of Robotic-assisted Peripheral and Central Lymphatic Surgery

Authors:

Carlotta I, Grünherz A, and Lindenblatt N.

Journal of Surgical Oncology

Published September 2024

Surgical Treatments of Lymphedema—a Literature Review on Robot-assisted LVA

Authors:

Engström O and Mani M

Gland Surgery

Published June 2024

Central Lymphatic Surgery

Authors:

Grünherz L and Lindenblatt N.

Plastic & Aesthetic Research

Published May 2023

Robotic-assisted Microsurgery for Lymphedema Treatment

Authors:

Gousopoulos E, Grünherz L, Giovanoli P, and Lindenblatt N

Plastic & Aesthetic Research

Published February 2023

Robotic-assisted Microsurgery and Its Future in Plastic Surgery

Authors:

Aitzetmuller M, Kliez ML, Dermietzel A, Hirsch T, and Kückelhaus M

Journal of Clinical Medicine

Published June 2022

Back to the Future: Robotic Microsurgery

Authors:

Innocenti M

Archives of Plastic Surgery

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The Symani Surgical System is authorized for use in the U.S. by the FDA and is a CE marked medical device.
Consult your local representative to confirm availability in other geographies.
For product indications specific to your region, visit www.mmimicro.com/indications.

Caution: Federal law restricts this device to sale by or on the order of a physician.

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