



## TECHNOLOGY

# DURAL REPAIR DEVICE AND METHOD OF USE

## OVERVIEW

### DURAL REPAIR DEVICE AND METHOD OF USE

#### Summary

The technology described in patent WO 2019/055551 is a tissue sealing device designed for dural repair during surgeries involving the central nervous system. Dural repair involves the sealing and healing of the dura mater, a tough protective membrane surrounding the brain and spinal cord. It is critical for preventing the leakage of cerebrospinal fluid (CSF), which can lead to complications. The device comprises a multi-composite plate with a rigid top layer and a softer bottom layer, which can be molded under heat treatment to provide a watertight seal over the surgical site. The device's innovative dual-layer design and moldability make it a novel solution for preventing complications such as cerebrospinal fluid leakage during surgeries, addressing a critical need in the medical sector.

#### Market

The tissue sealing device described in the patent is particularly suited for surgeries involving the central nervous system, specifically in dural repair. According to the American Association of Neurological Surgeons, over 1.62 million neurosurgical procedures are performed annually in the United States alone. The global neurosurgical devices market was valued at approximately USD 7.3 billion in 2019 and is expected to reach USD 13.5 billion by 2024, growing at a CAGR of around 13% between 2019 and 2024. The device can also be used in general surgeries for sealing wounds and preventing infections. The global wound care market is valued at USD 19.8 billion in 2019 and is projected to grow at a CAGR of 3.8%, reaching USD 27.9 billion by 2026. This growth is attributed to the increasing prevalence of chronic wounds, surgeries, and the need for advanced treatment modalities. As the global population ages, there is an expected increase in the number of surgeries, including spinal surgeries. The spinal surgery devices market was valued at USD 12.67 billion in 2020 and is expected to reach USD 16.65 billion by 2027, at a CAGR of 4.1%. The tissue sealing device could find extensive applications in this market, given its utility in dural repair and protection during spinal surgeries.

#### Technology

The technology described in the patent WO 2019/055551 is a tissue sealing device specifically designed for dural repair during surgeries involving the central nervous system. The device is composed of a multi-composite plate that has a top layer and an attached bottom layer. The top layer is made from a rigid and formable resorbable thermoplastic material, while the bottom layer is composed of a softer and compressible material. This combination allows the device to be moldable under heat treatment, enabling it to be customized to the specific anatomy and requirements of the surgical site. The primary function of this device is to provide a tight seal over a treatment site, which is crucial in preventing the leakage of cerebrospinal fluid (CSF) and subsequent complications.

The top layer of the device is designed to be rigid yet formable, which is essential for providing structural support to the dura mater during and after surgery. The bottom layer, being softer and compressible, acts as a cushion and ensures that the device conforms to the contours of the surgical site. This dual-layer design is central to the device's functionality. The device can include features such as a hole for the placement of a bone fastener and a valvular pore for the insertion of a needle. These features further enhance the versatility and applicability of the device in various surgical scenarios. The device can be secured to the treatment site through sutures or bone fasteners, and its moldability allows it to be cut and shaped according to the specific requirements of the surgery.

## References

American Association of Neurological Surgeons, "Neurosurgical Procedures Statistics". [American Association of Neurological Surgeons \(aans.org\)](https://www.aans.org)

Markets and Markets, "Neurosurgery Devices Market by Product – Global Forecast to 2024 ". [Neurosurgery Devices Market - Global Forecasts to 2024 | By Product & Application | MarketsandMarkets](https://www.marketsandmarkets.com/Neurosurgery-Devices-Market-Global-Forecasts-to-2024-By-Product-Application.aspx)

Fortune Business Insights, "Wound Care Market Size, Share & Industry Analysis, By Product, By Application, By End User, and Regional Forecast, 2020-2027". [Wound Care Devices Market Size, Share | Global Report \[2020-2027\] \(fortunebusinessinsights.com\)](https://www.fortunebusinessinsights.com/Wound-Care-Devices-Market-Size-Share-Global-Report-2020-2027)

Allied Market Research, "Spinal Surgery Devices Market by Technology, Type, and Surgery Type: Global Opportunity Analysis and Industry Forecast, 2023-2032". [Spinal Surgery Devices Market \(alliedmarketresearch.com\)](https://www.alliedmarketresearch.com/Spinal-Surgery-Devices-Market)

## Other Potential Fields and Applications:

**Orthopedic Surgery:** The device could be adapted for use in orthopedic surgeries to provide support and sealing for bone and joint repairs. The rigidity and moldability of the device could be beneficial in ensuring the stability of bone structures.

**Veterinary Medicine:** The device could be used in surgeries on animals, particularly in veterinary neurosurgery. Similar to human medicine, preventing CSF leakage is critical in veterinary surgeries involving the central nervous system.

## Advantages:

Customizable Shape (The device can be molded to fit the specific anatomy of the surgical site)

Dual-layer Design (Combines rigidity with cushioning for optimal performance)

Versatile Application (Can be used in various surgical scenarios)

## CONTACT INFO

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## Additional Information

### INSTITUTION

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### LICENSE STATUS

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### CATEGORIES

- Devices
- Medical implants
- Surgical devices

### INVESTIGATOR(S)

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### ATTACHMENTS

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