

# Wound healing

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**Wound** Healing is a complex and dynamic process that involves modifying the wound **environment** depending on the patient's health status.

Unaffected wound healing and good cosmetic results after a neurosurgical **procedure** are important factors measuring a level of care.

In neurosurgical cases, problems related to wound healing can vary from simple **wound dehiscence** to multilayer defects. A study demonstrates an effective method to prevent persistent **cerebrospinal fluid fistula** using reinforcing acellular dermal matrix in neurosurgical patients with **wound dehiscence**<sup>1)</sup>.

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Early BEV administration is effective in controlling early clinical deterioration and does not increase the risk of wound-healing complications. Further studies with larger numbers of patients are needed to validate the results<sup>2)</sup>.

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The available published data may suggest a higher risk of **wound healing** concerns and lower than average bone fusion with disease-modifying **antirheumatic drugs**, although this may be under-reported given the current state of the literature<sup>3)</sup>.

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Data suggest that **surgical site infection** and wound dehiscence are significantly reduced with the addition of incisional **negative pressure wound therapy** in degenerative spine disease and trauma setting<sup>4)</sup>.

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During a one-year microneurosurgical fellowship, a wound closure under the microscope in 200 of 524

neurosurgical operations at the Department of Neurosurgery, Helsinki University Central Hospital. Supratentorial approaches were employed most frequently in 143 patients (72%). Surgeries for infratentorial lesions and the spinal canal comprised 48 (24%) and 9 procedures (4%), respectively. Mean duration of the surgery from skin to skin was 1.8 (range 0.5-6.2) hours. After intradural hemostasis was completed by the senior author, further steps including dural suturing, bone flap fixation, and wound closure were performed by the first author. Wound condition was assessed during the early and late postoperative period. Mean follow-up was 3.2 (range 1-10) months.

Early postoperative healing of the wound was uneventful in 180 patients (90%). No wound rupture or postoperative hematoma occurred. In five patients (2.5%), lumbar puncture or spinal drainage was necessary due to significant subcutaneous liquor collection. No wound revision was required. At follow-up, in 196 patients (98%) the postoperative scar was in perfect condition. Neither skin necrosis nor healing problems occurred.

Based on the result are that the high magnification of operating microscope to be beneficial when closing neurosurgical wounds; it allows (1) better hemostasis, (2) precise wound margin approximation, (3) atraumatic handling of the tissues, and (4) improvement of the manual dexterity of the neurosurgeon <sup>5)</sup>.

## Complications

[Surgical site infection.](#)

[Wound dehiscence.](#)

## Factors Affecting Wound Healing

Age and gender

Sex hormones

Stress

Ischemia

Diseases: diabetes, keloids, fibrosis, hereditary healing disorders, jaundice, uremia

Obesity

Medications: glucocorticoid steroids, non-steroidal anti-inflammatory drugs, chemotherapy

Alcoholism and smoking

Immunocompromised conditions: cancer, radiation therapy, AIDS

Nutrition

[Skin contamination](#)

# Wound therapy

see [Wound therapy](#).

1)

Lee H, Eom YS, Pyon JK. A method to prevent Cerebrospinal fluid fistula: Reinforcing acellular dermal matrix. Arch Craniofac Surg. 2020 Feb;21(1):45-48. doi: 10.7181/acfs.2019.00535. Epub 2020 Feb 20. PubMed PMID: 32126620.

2)

Matsuda M, Kohzuki H, Tsurubuchi T, Ishikawa E. Timing of bevacizumab administration after biopsy for unresectable newly diagnosed glioblastoma. Surg Neurol Int. 2022 Dec 16;13:583. doi: 10.25259/SNI\_959\_2022. PMID: 36600767; PMCID: PMC9805652.

3)

Mamaril-Davis JC, Aguilar-Salinas P, Avila MJ, Villatoro-Villar M, Dumont TM. Perioperative management of disease-modifying antirheumatic drugs for patients undergoing elective spine surgery: a systematic review. Eur Spine J. 2022 Feb 8. doi: 10.1007/s00586-021-07080-z. Epub ahead of print. PMID: 35132461.

4)

Vidalis BM, Ngwudike SI, McCandless MG, Chohan MO. Negative Pressure Wound Therapy in Facilitating Wound Healing After Surgical Decompression for Metastatic Spine Disease. World Neurosurg. 2021 Dec 22:S1878-8750(21)01907-0. doi: 10.1016/j.wneu.2021.12.063. Epub ahead of print. PMID: 34954060.

5)

Kivelev J, Hernesniemi J. Four-fold benefit of wound closure under high magnification. Surg Neurol Int. 2013 Sep 13;4:115. doi: 10.4103/2152-7806.118171. eCollection 2013. PubMed PMID: 24083051; PubMed Central PMCID: PMC3779394.

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