

Skin depression after chronic subdural hematoma surgery

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One [burr hole](#) surgery is a common treatment modality for initial [chronic subdural hematoma](#) and [stereotactic](#) hematoma surgery, but severe [skin depression](#) is often a [postoperative complication](#).

Whereas a number of reports have discussed [cranioplasty](#) to avoid large [bone defects](#), only a few reports have described the problem of small bone defects which, despite their minor size, could result in bothersome cosmetic problems ^{1) 2)}.

In a randomized trial, Stienen et al. enrolled adult patients with symptomatic cSDH. Patients received burr hole trepanation with (intervention) vs without burr hole covers (control) in a 1:1 ratio. Patients requiring evacuation of bilateral cSDHs served as their internal control. Primary outcome was satisfaction with the esthetic result of the scar, measured from 0 (dissatisfied) to 10 (very satisfied) on the Esthetic Numeric Analog (ANA) scale at 90 days. Secondary outcomes included ANA scale, rates of skin depression, complications, as well as neurological, disability, and health-related quality of life outcomes until 12 months.

They included 78 patients (55 with unilateral and 23 with bilateral cSDH; median age 78 years, 83% male) between 03/2019 and 05/2021, 50 trepanations for the intervention and 51 for the control group. In an intention-to-treat analysis, the ANA scale scores were 9.0 (intervention) and 8.5 (control arm) at 90 days ($P = .498$). At 12 months, the ANA scale scores were 9.0 and 8.0 for the intervention and control groups, respectively ($P = .183$). Skin depressions over the frontal burr hole were noted by 35% (intervention) and 63% (control) of patients at 90 days ($P = .009$) and by 35% and 79% ($P < .001$) at 12 months, respectively. There were no differences in complications, neurological, disability, and health-related quality of life outcomes.

[Satisfaction](#) with the esthetic result of the scar was inherently high. This study does not show evidence for improvement on the ANA scale by applying a burr hole cover. The application of burr hole covers resulted in less skin depressions and did not negatively affect complication rates or outcomes ³⁾.

Ichimura et al. report the [autologous bone](#) dust technique, which uses autogenous bone dust generated during burr hole creation to prevent cosmetic deformity.

The [autologous bone dust technique](#) was performed for 51 sides on which burr hole surgery was conducted mainly for chronic subdural hematoma and stereotactic hematoma removal. As much bone dust as possible was collected during the burr hole creation and preserved until closure and the burr hole was plugged with the autologous bone dust. The skin depression after surgery was classified as “no or mild” or “severe” by palpating the postoperative scar. The postoperative osteogenesis was evaluated with a bone window or three-dimensional bone computed tomography (CT).

The rate of no or mild skin depression was 86.3%. Osteogenesis in the bone window or on three-dimensional bone CT was observed in 88.6% of the cases with no or mild skin depression, whereas no osteogenesis was found in 11.4%. The rate of no or mild skin depression in patients aged greater than 82 years old (74.1%) was significantly lower than that in those aged less than 82 years old (100%).

The autologous bone dust technique is effective in preventing skin depression after one burr hole surgery without using artificial materials ⁴⁾.

The purpose of a study of Vasella et al. was to evaluate the efficacy of burr hole cover placement to improve the aesthetic outcome.

They reviewed consecutive patients treated by burr hole trepanation for cSDH with or without placement of burr hole covers by a single surgeon between October 2016 and May 2018. The clinical data, including [complications](#), were derived from the institution's prospective patient registry. The primary endpoint was the aesthetic outcome, as perceived by patients on the aesthetic numeric analog (ANA) scale, assessed by means of a standardized telephone interview. Secondary endpoints were skin depression rates and wound pain, as well as complications.

From n = 33, outcome evaluation was possible in n = 28 patients (n = 24 male; mean age of 70.4 ± 16.1 years) with uni- (n = 20) or bilateral cSDH (n = 8). A total of 14 burr hole covers were placed in 11 patients and compared to 50 burr holes that were not covered. Patient satisfaction with the aesthetic outcome was significantly better for covered burr holes (mean ANA 9.3 ± 0.74 vs. 7.9 ± 1.0 ; $p < 0.001$). Skin depressions occurred over 7% (n = 1/14) of covered and over 92% (n = 46/50) of uncovered burr holes ($p < 0.001$). There was no difference in wound pain ($p = 0.903$) between covered and uncovered sites. No surgical site infection, cSDH recurrence, or material failure was encountered in patients who had received a burr hole plate.

In this retrospective series, placement of [burr hole covers](#) was associated with improved aesthetic outcome, likely due to reduction of skin depressions. A randomized controlled trial is developed to investigate whether adding burr hole covers results in superior aesthetic outcomes, without increasing the risk for complications ⁵⁾.

A hundred and ninety-six cases of burr hole trephinations for CSDHs between January 2009 and December 2013 were assigned into two groups; Gelfoam packing only (GPO) and reconstruction using titanium BHC group, according to the modalities of burr hole reconstructions. The incidences and depths of scalp depressions and incidences of postoperative complications such as infections or instrument failures were analyzed in both groups. We also conducted telephone surveys to evaluate

the cosmetic and functional outcomes from patient's aspect.

Significantly lower incidence ($p < 0.0001$) and smaller mean depth ($p < 0.0001$) of scalp depressions were observed in BHC than GPO group. No statistical differences were seen in postoperative infection rates ($p = 0.498$) between the two groups. There were no instrument failures in BHC group. According to the telephone surveys, 73.9% of respondents with scalp depressions had cosmetic inferiority complexes and 62.3% experienced functional handicaps during activities of daily life.

Titanium BHC is highly effective for reconstruction of skull defect after burr hole trephination of CSDH, and provides excellent cosmetic and functional outcomes without significant complications ⁶⁾.

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