

Epidural Fluid Collection

[Epidural fluid](#) collection (EFC) is one of the [cranioplasty complications](#) and is easily ignored.

Predictive factors

[Predictive factors](#) of EFC formation are unknown.

For Kim et al. EFC after cranioplasty is predicted by postoperative air bubbles in the [epidural space](#) ¹⁾.

For Lee et al. air bubbles in the epidural space and dural calcification are proposed to be the predictive factors in the formation of EFC after cranioplasty. ²⁾.

Pathologic mechanism

Unknown.

Case series

A total of 340 patients who underwent cranioplasty were retrospectively analyzed in this study. A series of factors were compared in the EFC and none-EFC groups and further compared in the progress epidural fluid collection (PEFC) and none-PEFC subgroups to determine the predictive factors. The t-test, χ test, and logistic regression analysis were used in statistical analysis.

The rate of EFC formation was 34.41%, and the size of a skull defect, the preoperative volume of collapse, intraoperative dura suspending, a pre- or intraoperative ventriculoperitoneal shunt (V-P shunt), and a postoperative air bubble in epidural space were predictive factors for EFC formation. Furthermore, the incidence of PEFC was 10.29%, the size of skull defects and intraoperative dura suspending were predictive factors for PEFC formation. The protein ratio and lactate dehydrogenase (LDH) ratio of effusion to serum were >0.5 and 0.6 , respectively. There was no adverse prognosis.

Although EFC can be treated with conservative therapy, we need to emphasize EFC incidence and development. As neurosurgeons, it is necessary to analyze the preoperative predictive factors of EFC, pay attention to the intraoperative details such as [dural tenting sutures](#) to prevent PEFC formation, and the early intervention should be performed in the postoperative ³⁾.

From January 2004 to December 2012, 117 cranioplasty was performed. One-hundred-and-six of these patients were classified as either having EFC, or not having EFC. The two groups were compared to identify risk factors for EFC. Statistical significance was tested using the t-test and chi-square test, and logistic regression analysis.

Of the 117 patients undergoing cranioplasty, 59 (50.4%) suffered complications, and EFC occurred in

48 of the patients (41.0%). In the t-test and chi-test, risk factors for EFC were size of the skull defect ($p=0.003$) and postoperative air bubbles in the epidural space ($p<0.001$). In a logistic regression, the only statistically significant factor associated with the development of EFC was the presence of postoperative air bubbles. The EFC disappeared or regressed over time in 30 of the 48 patients (62.5%), as shown by follow-up brain computed tomographic scan, but 17 patients (35.4%) required reoperation.

EFC after cranioplasty is predicted by postoperative air bubbles in the epidural space. Most EFC can be treated conservatively. However, reoperation is necessary to resolve about a third of the cases. During cranioplasty, special attention is required when the skull defect is large since EFC is then more likely ⁴⁾.

Lee et al. reviewed retrospectively the demographic, clinical, and radiographic data in 59 patients who underwent the first cranioplasty following [decompressive craniectomy](#) during a period of 6 years, from January 2004 to December 2009. They compared demographic, clinical, and radiographic factors between EFC group and no EFC group. The predictive factors associated with the development of EFC were assessed by logistic regression analysis.

Overall, 22 of 59 patients (37.3%) suffered from EFC following cranioplasty. EFC had disappeared ($n=6$, 31.8%) or regressed ($n=6$, 31.8%) over time on follow up brain computed tomographic (CT) scans. However, 5 patients (22.7%) required reoperation due to symptomatic and persistent EFC. Predictive factors for EFC were male [odds ratio (OR), 5.48; 95% CI, 1.26-23.79], air bubbles in the epidural space (OR, 12.52; 95% CI, 2.26-69.28), and dural calcification on postoperative brain CT scan (OR, 4.21; 95% CI, 1.12-15.84).

Most of EFCs could be treated by conservative therapy. Air bubbles in the epidural space and dural calcification are proposed to be the predictive factors in the formation of EFC after cranioplasty. ⁵⁾.

References

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