

## Fluorescein Assisted Endoscopic repair of the cerebrospinal fluid rhinorrhoea

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### Abstract

CSF rhinorrhoea indicates an open communication between the intracranial cerebrospinal fluid and the nasal cavity. It can be traumatic and spontaneous. The aim of this study was to assess the outcome of endoscopic repair of cerebrospinal fluid fistula using fluorescein. This retrospective study included 30 patients of both sexes, with a mean age of 44.6 years. All patients underwent lumbar administration of 5% sodium fluorescein solution preoperatively. Fistula was closed using three-layer graft and fibrin glue. Cerebrospinal fluid fistulas were commonly located in the ethmoid (47%) and cribriform plate (23%). Most patients presented with traumatic cerebrospinal fluid fistulas (2/3 of patients). The reported success rate for first attempt repair was 97%. Complications occurred in one patient who presented with acute meningitis. Endoscopic diagnosis and repair of cerebrospinal fluid fistulas using fluorescein intrathecally has high success rate and low complication rate. The arachnoid membrane, dura matter, bone skull base and periosteum, and nasal mucosa layers of the arachnoid membrane, dura matter, and periosteum break down, resulting in CSF rhinorrhoea. Non-traumatic and traumatic CSF leaks are the most common types of persistent CSF leaks. Spontaneous or congenital CSF leaks, as well as leaks induced by intracranial or skull base tumours causing skull base erosion, are non-traumatic causes. Traumatic leaks are more common, and they can be iatrogenic (due to anterior skull base and endoscopic sinus surgery [ESS]) or non-iatrogenic. CSF rhinorrhoea occurs in less than 1% of ESS patients, yet it is a prevalent source of traumatic CSF leak. Clear, unilateral rhinorrhoea is the most common clinical sign of CSF leak, which is aggravated by bending over or executing the Valsalva manoeuvre. The appearance of a headache should trigger suspicions of elevated intracranial pressure or intracranial disease in the doctor. CSF indicators such as Beta-2 transferrin, a sensitive and specific marker, can be used in the lab to confirm the diagnosis. The majority of traumatic CSF leaks will resolve with conservative care, but recurrent CSF leaks will almost always require surgery. Over the last 30 years, the treatment of CSF rhinorrhoea has progressed considerably. Craniotomy was employed for repairs prior to the development of the endoscopic technique, which had a variable success rate and a relatively high morbidity. In 1981, Wigand recounted the first time an endoscopic technique was used to fix a CSF leak. Since then, multiple case series and studies have been published that explain various endoscopic procedures and materials for repair, with success rates ranging from 60% to 100%, with an average of around 90%. The goal of this study is to examine the success rate of transnasal

endoscopic repair of CSF rhinorrhoea, as well as the impact of patient variables, repair procedures, and adjuvant therapy. A search was conducted of all publications published up until June 1, 2014, that reported on the outcomes of CSF rhinorrhoea correction. Two of the authors separately searched PubMed, Medline/Old Medline, and Cochrane Central databases using a keyword search method (S.S. and J.B.). Cerebrospinal fluid leak, CSF leak, CSF fistula, CSF leak or fistula repair, endoscopic sinus surgery or ESS problems were all utilised as keywords. Further research were identified by looking through the reference lists of the articles. Studies were to be full-text papers in English, with recorded follow-up to measure success rate, and more than 5 instances had to be included to match the study's inclusion requirements. If the CSF leak correction was done during the original surgery for iatrogenic CSF rhinorrhoea, the study was ruled out. Intrathecal fluorescein aids in the diagnosis of the site of a CSF leak, however it is not approved for this application. Nonetheless, it is widely used. This medicine can cause serious side effects such as cardiac arrhythmias, convulsions, and even death. Lumbar drains and antibiotics are two adjuvant therapy for CSF leak healing. Lumbar drains are also commonly used, however they are usually reserved for situations having high intracranial pressure and significant deformities. To aid in the localization of the leak site, it is common practise to place the lumbar drain in the operating room prior to surgery and maintain it closed until the final stage of repair. Some studies also report the use of lumbar drains to reduce the risk of CSF rhinorrhoea and a significant decrease in the rate of intraoperative CSF leak in transphenoidal surgery from 41% to 5%. According to a poll of ENT surgeons in the United States, 67 percent of respondents utilise lumbar drains on a regular basis, primarily to relieve high intracranial pressure. However, in a group of 36 patients, a more recent study finds success rates of 97.2 percent without the use of intrathecal fluorescein or lumbar drains. As a result, these two adjuvant medicines should only be used in the most difficult instances, and patients should be properly counselled about potential risks. Antibiotics should not be used concurrently with CSF leak repair as a preventive against infections, according to the available evidence. Some studies suggest that because the nasal cavity is extensively polluted, there is a theoretically increased chance of infection, but there is no solid proof for this. Although Chaaban et al. claim effectiveness with acetazolamide in lowering CSF leak repair failure in patients with elevated intracranial pressure, this has not been duplicated elsewhere. Meningitis is the most prevalent complication linked with endoscopic CSF leak repair, but the risk was reported to be very low in a prior systematic study, at 0.03 percent. Hydrocephalus, mucocoele development, cerebral abscess, and pneumocephalus are some of the other issues that have been recorded. Endoscopic correction of CSF rhinorrhoea is safe and successful, according to the literature. It has nearly entirely supplanted

prior open approaches. The ethmoid roof/cribriform plate region is the most prevalent source of CSF leak in the nasal cavity. CSF rhinorrhoea is still most commonly caused by traumatic CSF leaks, particularly iatrogenic CSF leaks. This study is hampered by publication bias, which occurs when

institutions publish their successful outcomes, as well as linguistic bias. To draw any significant conclusions about their efficacy, more research on the graft materials employed and adjuvant treatment is required.

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