

Ventriculopleural shunt

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A ventriculopleural shunt (VPS) is a [medical device](#) used to treat certain types of hydrocephalus (a condition characterized by the accumulation of cerebrospinal fluid, or CSF, within the brain ventricles) by diverting excess CSF from the ventricles to the [pleural](#) space, which is the cavity surrounding the lungs. This shunt is an alternative to more traditional methods of CSF diversion, such as a [ventriculoperitoneal shunt](#), where CSF is diverted into the peritoneal cavity (abdomen).

Epidemiology

The epidemiology of ventriculopleural shunts is characterized by its relatively low frequency of use in clinical practice, typically reserved for patients in whom other methods of CSF diversion have failed or are not feasible.

Indications

Ventriculopleural [shunt](#) (VPLS) has also been used as an alternative to the peritoneal and atrial shunts since 1954.

It is considered for draining CSF in selected patients when conventional sites are not suitable either due to adhesions, infection, thrombosis or obliteration. Studies have suggested that VPLS is an acceptable alternative for draining CSF in children as well as among adults.

The most common complication following VPLS placement is pleural effusion ¹⁾.

Case series

A single-center, retrospective case series analysis was conducted for VPL shunt insertions and

revisions over a period of 5 years. Demographic as well as clinical data were collected. Ventriculopleural shunt survival was assessed using Kaplan-Meier curves and the log rank (Cox-Mantel) test.

Twenty-two VPL shunts were inserted in 19 patients. Median survival of the VPL shunts was 14 months. Pathological indication for the VPL shunt did not significantly affect survival. A total of 10 complications was observed: 2 infections, 2 cases of overdrainage, 2 obstructions, 1 distal catheter retraction, 2 symptomatic pleural effusions, and 1 asymptomatic pleural effusion.

Ventriculopleural shunting is a safe and viable second-line procedure for cases in which ventriculoperitoneal shunts are unsuitable. While VPL shunts have a high revision rate, their complication rate is comparable to that of VP shunts. Ventriculopleural shunt survival can be improved by careful patient selection and the implementation of a combination of valves with antisiphon devices ²⁾.

Case reports

The sunken flap or [sinking skin flap syndrome](#) is one of the [decompressive craniectomy complications](#) that can be observed. More rare, sinking skin flap syndrome can occur as an iatrogenic complication of pleural [effusion](#) evacuation via chest tube placement in the presence of [ventriculopleural shunt](#).

The case of a Hispanic male patient in his 20s who presented to the [emergency](#) department after sustaining a penetrating gunshot wound to the head. In addition to undergoing an emergent decompressive craniectomy, a [ventriculopleural shunt](#) was subsequently placed as a treatment for [hydrocephalus](#). Two days after shunt placement, the patient developed significant hydropneumothorax that did not respond to observational management. Owing to the severity of his hydropneumothorax, a chest tube was placed for evacuation, but he developed a sinking skin flap at the craniectomy site. The suction function of the chest tube was discontinued, and the [ventriculopleural shunt](#) pressure was increased. Within 24 hours, the skin flap reexpanded. They hypothesize that the inherently negative pressure of the pleural space combined with the significant suction effect from chest tube evacuation placed him at risk of sinking skin flap syndrome despite having an antisiphon device.

The case highlights the importance of understanding [cerebrospinal fluid dynamics](#) with shunt presence and suggests a potential treatment framework for iatrogenic sinking skin flap syndrome in the presence of [ventriculopleural shunt](#) ³⁾.

This case report provides an important contribution to the understanding of sinking skin flap syndrome in patients with complex injuries involving both ventriculopleural shunts and chest tubes. The authors rightly emphasize the importance of CSF dynamics and the delicate balance required in managing patients with multiple ongoing interventions. Although the case is rare and the management approach is somewhat individualized, the insights provided could lead to more nuanced care strategies in similar future cases.

However, the limitations of generalizability, the lack of mechanistic detail, and the absence of long-term follow-up suggest the need for further research to confirm these findings in a broader patient population and to better understand the fluid dynamics at play. Overall, this case serves as a useful clinical reminder of the potential for iatrogenic complications in patients with complex medical

histories and multiple interventions.

1)

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2930656/>

2)

Craven C, Asif H, Farrukh A, Somavilla F, Toma AK, Watkins L. Case series of ventriculopleural shunts in adults: a single-center experience. J Neurosurg. 2017 Jun;126(6):2010-2016. doi: 10.3171/2016.4.JNS16641. Epub 2016 Jul 8. PubMed PMID: 27392271.

3)

Liang SQ, Tarzi FP, Sung GY, Poblete RA. Sunken flap following chest tube placement in the presence of ventriculopleural shunt: a case report. J Med Case Rep. 2024 Dec 25;18(1):609. doi: 10.1186/s13256-024-04963-9. PMID: 39719649.

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Last update: **2024/12/25 11:43**

