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 [1].

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.

An elderly gentleman with traumatic brain injury underwent DC. He later developed a Syndrome of the trephined as unexplained agitation which responded to cranioplasty by returning to a state of calm. His cognitive function further improved over a period of 6 months. This is an unusual observation reported in this case.

Timely recognition of the cognitive complications of craniectomy that may respond to early cranioplasty promises to decrease the length of hospital stay and enhance rehabilitation in such patients [2]

Demaerel R, Klein S, Van Calenbergh F. Syndrome of the Trephined presenting as Foix-Chavany-Marie syndrome [published online ahead of print, 2020 Jun 30]. Clin Neurol Neurosurg. 2020;196:106058. doi:10.1016/j.clineuro.2020.106058

A case report of the syndrome of the trephined revealed by vertical diplopia [3].

2015

A 52 year old male suffered severe head injury in a road traffic accident and underwent a craniectomy and contusectomy of the left Fronto-Temporo-Parietal (FTP) region for treatment of Acute Subdural hematoma (SDH) as well as hemorrhagic and non-hemorrhagic contusions of the brain with severe mass effect. On recovery from this acute event he was bed bound, on tracheostomy, his GCS was E4VTrM4 with residual right sided hemiparesis. Three months later, he developed Hydrocephalus for which a Right Ventriculo-Peritoneal (V-P) shunt was performed. Following this procedure, severe depression of the skin/scalp flap occurred and the neurological recovery was not as expected. He was diagnosed as a case of “Syndrome of the trephined”. An immediate Cranioplasty was performed, on the third month following the craniectomy procedure, in an attempt to resolve the rapidly deteriorating neurological status of the patient.

In the case presented, following the early Cranioplasty which was performed within three months of the initial craniectomy, the patient's neurological condition and cognitive functions showed a remarkable, immediate and dramatic improvement. The early Cranioplastic repair led to a remarkable clinical recovery of the patient, with improvement in the cognitive behavior and motor deficit with a rapid reversal of the sensorimotor paresis, reflecting an improvement in brain perfusion [4].

2012

Kwon et al., report a case of a patient with sinking skin flap syndrome who suffered from reperfusion injury after cranioplasty [5].

2009

A 77-year-old male patient with an acute subdural hematoma was treated using a hemicraniectomy and evacuation of the hematoma. On the 9th postoperative day there was deterioration in sensorium associated with a sunken scalp flap and worsening midline shift on CT. A significant improvement in sensorium and a filling up of the scalp flap occurred after maintaining the patient's head in a dependent position. The patient subsequently made an excellent recovery following replacement of the bone flap [6].

An extreme syndrome of the trephined after decompressive craniectomy is reported by Bijlenga et al.

The most extensive clinical syndrome observed was established over 4 weeks and consisted of bradypsychia, dysartria, and limb rigidity with equine varus feet predominating on the right. The syndrome was aggravated when the patient was sitting with the sequential appearance over minutes of a typical parkinsonian levodopa-resistant tremor starting on the right side, extending to all four limbs, followed by diplopia resulting from a left abducens nerve palsy followed by a left-sided mydriasis. All signs recovered within 1-2 h after horizontalisation. It was correlated with an orthostatic progressive sinking of the skin flap, MRI and CT scan mesodiencephalic distortion without evidence of parenchymal lesion. Brain stem auditory evoked potential wave III latency increases were observed on the right side on verticalisation of the patient. EEG exploration excluded any epileptic activity. Symptoms were fully recovered within 2 days after cranioplasty was performed. The cranioplasty had to be removed twice due to infection. Bradypsychia, speech fluency, limb rigidity and tremor reappeared within a week after removal of the prosthesis. While waiting for sterilisation of the operative site, the symptoms were successfully prevented by a custom-made transparent suction-cup helmet before completion of cranioplasty [7].

2004

A 45-year-old lady underwent right fronto-parietal craniotomy and subtotal excision of a parasagittal meningioma. Bone flap was not replaced as it was infiltrated by the tumor. In the postoperative period she developed episodes of altered sensorium associated with worsening of left hemiparesis and a sunken scalp at the site of bone defect. Computed tomography (CT) of brain showed sunken scalp flap in the right fronto-parietal region with compression of the underlying brain. A diagnosis of syndrome of the trephined was considered and her symptoms improved with cranioplasty [8].

1)
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