Fronto-ethmoid-naso-orbital depressed skull fracture

- Case Report: Presumed cerebral salt wasting syndrome in a 10-week-old German Shorthaired Pointer
- Perioperative clinical and radiological predictors of late post-traumatic seizures in surgically treated patients with depressed skull fractures: A prospective observational study
- Ping-pong skull fracture in a neonate managed successfully with vacuum-assisted technique
- The Usefulness of Vascularized Flap Craniotomy for Open-Wound Depressed Skull Fractures
- Should pediatric patients with isolated skull fractures be admitted, transferred, or discharged from the emergency department, and what are the economic consequences? Original series, systematic review of the literature, and a proposed admission protocol
- Intraoperative Skull Fracture During Halo Application in Subcranial Le Fort III: Strategies for Managing a Rare Complication
- Post-traumatic extensive chronic osteomyelitis of skull vault: An illustrative case report
- Surgical outcome after autologous bone chips replacement in depressed skull fractures: a single center experience

Nasoorbitoethmoid fractures account for ~5% of adult and 15% of pediatric facial fractures. The appropriate management of these injuries requires an understanding of the anatomic features of the region, the classification of injury severity, assessment, and treatment methods.Prompt and proper management of these injuries can achieve both adequate functional and aesthetic outcomes [1)]

A fronto-ethmoid-naso-orbital depressed skull fracture refers to a specific type of skull fracture that involves the frontal bone, ethmoid bone, nasal bone, and orbital bone.

Fractures involving the frontal, ethmoid, nasal, and orbital bones can be complex due to the proximity of critical structures like the brain and the eyes.

These types of fractures often result from significant head trauma, such as a high-velocity impact or a severe blow to the head.

Symptoms may include pain, swelling, deformity, and, in severe cases, neurological deficits.

Treatment

Management typically involves a comprehensive assessment, including imaging studies (such as CT scans) to evaluate the extent of the fracture and identify any associated injuries. Treatment may involve surgical intervention to lift and secure the depressed bone fragments, as well as addressing any associated injuries or complications. Neurological monitoring and supportive care are crucial in the management of these cases.

The medial canthal tendon and the fragment of bone on which it inserts ("central" fragment) are the critical factors in the diagnosis and treatment of nasoethmoid orbital fractures. The status of the tendon, the tendon-bearing bone segment, and the fracture pattern define a clinically useful classification system. Three patterns of fracture are appreciated: type I–single-segment central fragment; type II–comminuted central fragment with fractures remaining external to the medial canthal tendon insertion; and type III–comminuted central fragment with fractures extending into bone bearing the canthal insertion. Injuries are further classified as unilateral and bilateral and by their extension into other anatomic areas. The fracture pattern determines exposure and fixation. Inferior approaches alone are advised for unilateral single-segment injuries that are nondisplaced superiorly. Superior and inferior approaches are required for displaced unilateral single-segment injuries, for bilateral single-segment injuries, and for all comminuted fractures. Complete interfragment wiring of all segments is stabilized by junctional rigid fixation. All comminuted fractures require transnasal wiring of the bones of the medial orbital rim (medial canthal tendon-bearing or "central" bone fragment). If the fracture does not extend through the canthal insertion, the canthus should not be detached to accomplish the reduction [2).].

Fractures that demonstrate displacement or movement on examination require open reduction and stabilization. Identifying the extent and type of fracture pattern and associated injuries determines the exposure and method of fixation needed. Wide exposure with meticulous reduction is necessary, with stabilization of the medial orbital rim fragment using a transnasal wire technique. Plate-and-screw fixation of the superior and inferior rim is performed with bone graft reconstruction of the nose as needed. Attention to redraping of soft tissue in the naso-orbital valley with the use of nasal compression bolsters is a crucial step in the repair. Multiple clinical cases are used to illustrate the different fracture patterns, soft-tissue injuries, and surgical technique recommended. This organized approach has proven effective in restoring preinjury appearance. Early diagnosis combined with the aggressive surgical techniques described will optimize results and minimize the late posttraumatic deformity [3)]

Prevention

According to the National Highway Traffic Safety Administration (1990), there were more than 3 million motor vehicle accidents severe enough to lead to significant injury or fatality. Airbags may prevent brain and facial injury caused by these accidents.

A retrospective analysis was performed on motor vehicle collision data submitted to the Pennsylvania Trauma Outcome Study database from 1990 through 1995. Criteria for submission to the database included admission to the intensive care unit, death during hospitalization, hospitalization for >72 hours, or transfer to or from the receiving hospital. There were 15,450 patients who sustained facial trauma (identified by ICD-9 codes) and were analyzed for patterns of injury and the presence or absence of protective devices. Protective devices were categorized into four groups: airbag alone, airbag with seatbelt, seatbelt or car seat without airbag, and no restraining devices. Statistical analysis was performed using chi-squared test of association. For contingency tables with small expected frequencies, Fisher's exact test was used. There were 9408 male and 6042 female subjects, with a mean age of 38 years (range, 3 to 98 years). There were 11,672 drivers and 3778 passengers. Airbags were deployed in 429 instances. In 276 of these cases, additional restraint was provided with a seatbelt. Airbags were not deployed in 4866 cases when a seatbelt or a car seat was used. In 10,155 cases, no restraining device was employed. There was significantly more facial trauma in patients without protective devices ($p < 0.001$). Drivers sustained significantly fewer facial fractures when airbags were used, either alone or in combination with a seatbelt ($p < 0.001$); however, there was no difference in the number of facial lacerations. Among passengers, airbags provided protection from lacerations ($p < 0.001$) but had no impact on the incidence of facial fractures. In collisions in which airbags were deployed, the use of a seatbelt provided no additional protection from facial fractures or lacerations. In summary, the use of any protective device decreased the incidence of facial fractures and lacerations sustained in motor vehicle collisions ($p < 0.001$). Airbags provided the best protection of all currently available devices [4].

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2)

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3)

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4)

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