Inadvertent Insertion of Nasogastric Tube into the Brain

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Abstract
An unusual case of a nasogastric (Ryle’s) tube inserted in the brain in a patient having severe head injury with skull base fractures is reported here along with a brief review of literature. A 35 years male was referred from a peripheral institute following head trauma with endotracheal tube and nasogastric tube in situ. A CT scan of the brain showed multiple skull base fractures and a high parietal extradural hematoma. It also revealed that the nasogastric tube had inadvertently found its way into the brain through the lamina cribrosa of the ethmoid bone. The tube was removed under aseptic conditions in the operation theatre but the patient expired on day 2 of admission due to the head injuries sustained.

INTRODUCTION
Head trauma is a common phenomenon in modern communicating world due to vehicular accidents. Peripheral hospitals form the first-line of patient management, where the lack of accurate radiological diagnostic facilities and clinical expertise to tackle grave complications such as skull base fracture offset management of head injuries. The inherent risks in nasogastric intubation and the prevention of this rare, but known complication in head injury patients have been presented in a case of inadvertent intracranial insertion in a case of fracture of the skull base.

CASE REPORT
A 35-year-old male patient had sustained head injury following a vehicular accident. The patient was transferred to the nearest medical center, which was a peripheral health care center. Basic resuscitation; in the form of oral suctioning, intravenous access, nasogastric intubation, and urinary bladder catheterization was done along with administration of primary trauma care. As CT scan facilities were not available, the patient was immediately referred from the peripheral hospital to the Trauma Unit of L.T.M.G. Hospital, for a CT scan and a neurosurgery reference, in view of his poor general condition.

At the time of admission to the hospital, the patient’s general and neurological condition was poor, with a Glasgow coma scale of four and bilaterally fixed and non-reacting pupils. There was bleeding from the nose and ears; however, signs suggestive of external injury were absent. The patient was immediately sent for a CT scan brain and mid-face. The CT scan revealed multiple fractures of the frontal and parietal bone, roof of the left orbit, bilateral laminae papyracia, and both wings of the right sphenoid. There was a high parietal extradural hematoma, with subarachnoid hemorrhage, frontal cerebral contusions with extensive cerebral edema. There was descending transtentorial herniation. Surprisingly the nasogastric tube was also visualized coiled within the brain parenchyma, entering through the ethmoid sinus through the cribiform plate, and the distal end with lead balls was seen in the left parietal region (Figs. 1 and 2).

The nasogastric Ryle’s tube was promptly removed manually in the operation theatre under aseptic conditions and antibiotic cover. Excision of the frontal depressed fracture and removal of extradural hematoma was done. The patient was kept on ventilatory support. However, he succumbed to...
his injuries on the second day of hospitalization.

**DISCUSSION**

Though nasogastric intubation forms a simple and a routine procedure, inadvertent intracranial insertions have been documented, albeit rare. These instances have been seen in numerous clinical settings, commonly trauma. In non-trauma settings, inadvertent introduction of a nasogastric tube in the cranial cavity has been reported in a neonate following repair of unilateral choanal atresia. In trauma, this complication is seen following basal skull fractures and complex craniofacial injuries. This complication may occur as a result of either passage through a traumatic defect in the cribriform plate associated with a severe head injury or direct penetration through an intact cribriform plate by an improperly passed rigid nasogastric tube. A marked septal deviation, underdevelopment of the turbinates, and a high-grade pneumatization of the paranasal sinuses may favor false passage of the tube. Few cases in western literature have been described as having survived the complication. Manual removal under antibiotic prophylaxis followed by a dural repair for rhinorrhoea was the only intervention in one favorable case. Successful surgical procedures, which utilized craniotomies, positioned such that the nasogastric tubing could be removed in small, straight segments have also been described. The tubing in these cases was removed without increasing the neurological deficit, and the patients made an acceptable recovery considering their premorbid status.

To eliminate the possibility of this complication, numerous measures have been described which include oral intubation, nasogastric intubation under fluoroscopy, or nasogastric intubation under direct vision. Some authors suggest that a simple skull X-ray may not be sufficient in cases of head injury for nasogastric intubation which should be performed only after a cranial CT scan showing no disruption of the anatomic structures dividing the nose-pharynx from the brain parenchyma.

Our case highlights the need to be vigilant in nasogastric intubation in patients suspected of having skull base and maxillofacial injuries. In India, such cases are infrequently reported. Head injuries in particular, draw to themselves medicolegal considerations concerning the connection between death and insertion of a nasogastric tube. This may also contribute to the ascertaining of any possible professional responsibility of medical staff, in a case fraught with numerous legal complications.

**REFERENCES**