Nasal Injury and Nasal Foreign Bodies

Nasal Injury

Nasal injuries are the most common facial traumas. Assessment of these injuries aims to determine the presence of nasal fracture and associated head and facial injuries. The nasal bones are the most commonly fractured bones of the face, as they occupy a prominent, exposed position and have little structural support. Changes in appearance and function can be prevented by prompt and appropriate management. Rhinoplasty and septoplasty procedures are often performed to correct untreated nasal fractures.

Epidemiology

Nasal fracture is more commonly seen in young men aged 15-30 years, with fewer than 15% of such fractures occurring in those younger than 16 years of age and less than 1% of all facial fractures occurring in children younger than 5 years of age. Like adults, childhood fractures may commonly be caused by motor vehicle or sports-related trauma; however, other causes such as falls and child abuse must also be considered. In the elderly, nasal fractures occur secondary to falls.

Presentation

Assessment of nasal injury should include a careful search of other facial injuries, since the risk of important head injury trauma increases significantly with multiple facial injuries. Once significant head injury has been excluded, the presence of nasal fracture and the need for immediate or delayed referral to ENT is determined. External complications, internal complications and cosmetic appearance should also be considered.

History

Important features to note are:

- Mechanism of the injury - high-impact accidents are more likely to be associated with multiple facial and head injuries.
- Timing of the injury - obvious deformities are easier to visualise within hours after the injury. After about four hours, swelling may obscure accurate diagnosis.
- Patient age.
- Previous nasal procedures, trauma, ENT problems and use of intranasal decongestant or steroids

Examination

This should start distally and move proximally. It should include an intranasal examination.

Important features to note are:

- Significant rhinorrhoea (evaluate for a CSF leak) or haemorrhage:
  - Epistaxis implies mucosal disruption which increases suspicion of fracture, including possible nasal septum fracture.
  - The typical history of a CSF leak is that of clear, usually unilateral, watery discharge.

- Septal haematoma or haemorrhage.
- Septal deviation or malposition.
- Lacerations, ecchymoses, swelling and bruising.
- Crepitus and instability.
- Facial/mandibular fracture.
- Ophthalmoplegia.
- Facial anaesthesia.
Imaging
The diagnosis of nasal fracture is generally made on clinical grounds and imaging is usually unnecessary during the initial assessment. The Royal College of Radiologists guidelines state the following: "XRs are unreliable in the diagnosis of nasal fractures and even when positive do not usually affect patient management. XR or further imaging could be considered only after ENT/maxillofacial assessment, depending on local policy."[4]

Refer to ENT[5]
Immediate referral is required if there is:

- Marked deviation.
- Epistaxis that is failing to settle.
- Septal haematoma; this requires incision and drainage to prevent abscess and/or necrosis.
- CSF rhinorrhoea; this implies breach of the cribriform plate. CT and referral to neurosurgery are required.
- Widening of intercanthal distance suggests nasoethmoidal fracture which requires surgical repair.
- Facial anaesthesia, facial or mandibular fracture and ophthalmoplegia require immediate referral to the maxillofacial surgeons.

Management[5]
Patients without significant swelling or deformity may be discharged. For those with significant swelling:

- Give advice on using ice/simple analgesia. These will decrease the oedema and pain.
- Discharge - review in five days by A&E, GP or by phone.
- Patients with significant nasal deviation should be referred to ENT within 7-10 days of the injury.
- Adhesions to the surrounding soft tissue can occur in as few as 5-10 days. Fractured nasal bones usually heal in 2-3 weeks.
- Fracture reduction can be performed when it is possible to assess and manipulate the mobile nasal bones. This is usually within 5-10 days in adults and 3-7 days in children.
- Patients with little swelling may be suitable for immediate reduction.
- Closed reduction is preferred by most surgeons.
- Antibiotics are indicated if there is a laceration overlying the fracture, or if a septal haematoma has been incised.

Nasal foreign body[6]
This is most common in preschool children. Common foreign bodies (FBs):

- Beads
- Buttons
- Sweets
- Nuts
- Seeds
- Peas

Presentation
- They may present immediately if they are observed.
- There may be a clear history of nasal obstruction.
- They may present late, with a history of a persistent offensive discharge from one nostril.

Refer to ENT
- If there is a history of prolonged unilateral nasal discharge.
- If the FB is in a posterior position.
- If the patient is very unco-operative or agitated.
- If you are not experienced and/or confident.
Management\textsuperscript{[7]}

Before you start, make sure you have the correct equipment and that the child is being adequately held, in an accommodating position. Fewer attempts will reduce the anxiety of the parent and child.

- Use topical anaesthetic and vasoconstrictor (reduces swelling) spray in the affected nostril.
- Blow positive pressure through the nose - preferably by the parent blowing sharply through the child's mouth whilst obstructing the unaffected nostril. This has been shown to be relatively non-traumatic, with success rates of 79%.
- Use a nasal speculum and a hook or thin forceps, to hold the object. Be careful not to push the FB further back.
- Application of strong suction is sometimes sufficient to draw the object out.
- Pass a narrow balloon catheter past the FB, inflate and remove the catheter, pulling the FB with it. The Fogarty is preferred (compared to a Foley), as it is stiffer and stronger.
- Examine for signs of other FB - eg, nasal, ear, inhaled, etc.

Refer to ENT if unsuccessful after two attempts.

\textbf{NB}: if the FB is a small button battery, moisture within the cavity may lead to tissue damage. Irrigation or nasal wash should not be used. If the battery leaks, there may be liquefactive necrosis and organ injury. It should be removed immediately\textsuperscript{[8]}.

After successful removal of a nasal FB, careful examination of the involved nasal cavity as well as the other body orifices must be undertaken to exclude the presence of other unrecognised foreign bodies. Particular attention must be paid to the examination of the ear and sinuses on the involved side, as acute otitis media or sinusitis are commonly seen if the FB has been present for any length of time\textsuperscript{[9]}.

\section*{Septal perforation}

This is a defect through any portion of the cartilaginous or bony septum, with no overlying mucoperichondrium or mucoperiosteum on either side.

\subsection*{Presentation}

This may present with\textsuperscript{[10, 11]}:

- A nasal whistling sound.
- Discharge from the nose.
- Nasal congestion.
- Infection - eg, cellulitis, fever, discharge.
- Epistaxis.

\subsection*{Aetiology}

- Traumatic:
  - Nose-picking.
  - Trauma.
  - Septal haematoma may cause infection and abscess formation (which may lead to perforation) if not treated promptly.

- Iatrogenic:
  - Septal surgery.
  - Nasal intubation.
  - Bevacizumab used in chemotherapy has also been noted\textsuperscript{[12]}.

- Inflammation or malignancy:
  - Rodent ulcer.
  - Other malignancy.
  - Granulomatosis with polyangiitis (Wegener's granulomatosis), sarcoidosis.
  - Infection: tuberculosis, syphilis.
Related to inhalations:
- Inhalation of chrome or sulfurous salts, mercury or phosphorous.
- Vasconstrictive nasal sprays.
- Cocaine sniffing.
- Intranasal steroid sprays - concurrent use with decongestant sprays should be avoided.

Management
Early signs of nasal septal deterioration include bothersome crusting and bleeding. Such signs indicate that early referral for ENT evaluation is appropriate [13].

- A fibre-optic endoscope may be necessary to visualise fully the extent and position of the perforation.
- Treatment is symptomatic:
  - Nasal douching with saline helps keep the mucosa moist. This helps reduce crusting and bleeding.
  - Nasal emollients can be applied to the inside of the nose before bedtime.
- Patients who need oxygen delivered via a nasal cannula, should have the prongs of the cannula positioned so the jet of oxygen is not directed at the nasal septum.
- Surgical closure is difficult because the area is usually atrophic and has previously been operated upon. This option is reserved for patients whose symptoms are severely affecting their quality of life.

Further reading & references
- iRefer; Royal College of Radiologists
- Bhattacharya N; Clinical symptomatology and paranasal sinus involvement with nasal septal perforation. Laryngoscope. 2007 Apr;117(4):691-4.

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