



This injury is common in contact sports and in fights. If the blow is directly from the front, the nasal bones may be depressed inwards. The blow often comes from the side (usually a person's left side by a right handed assailant), so that the nasal bones are deviated to one side. Frequently a fracture also occurs in the septum (middle of the internal nose). If a nose has been broken in a motor vehicle accident, one should look for other facial fractures, particularly in the mid-face. The diagnosis of a nasal fracture is largely a clinical diagnosis. Simple fractures can be easily reduced using local anaesthesia. If, however, a fracture is present in the cartilaginous septum (middle of the internal nose), the external nose tends to redeviate slightly following simple manipulation. This is not solved using a simple nasal cast to hold the nasal bones in the correct position. A nasal cast stays on for only a week, whereas it takes a minimum of 6 weeks for nasal bones to heal.

## Symptoms of nasal injury

The patient may present complaining of nasal pain, nasal deformity, difficulty breathing through the nose as well as bleeding from the nose. Some patients may also complain of headache. When they have suffered the nasal injury their head may have extended backwards, as in a whiplash injury damaging the back of the neck. This neck damage may be responsible for a headache. These headaches usually settle without any major intervention. Sometimes occasionally further musculoskeletal work may be necessary.

## Examination

The nose is defined by the shadows that it creates. Artists draw noses by creating shadows. Alteration in the shadowing on either side of the nose leads to the perception of a nasal deviation (crooked nose). Two imaginary

curved lines running from the superciliary ridges (eyebrows), through the radix (base of the nose) to the tip defining points of the alar cartilages (tip of nose) are useful in evaluating the nose. This line is illustrated in the associated picture. When these smooth lines are disrupted, the observer's eye may notice a deformity. The best time to assess nasal injury is immediately after the injury, before temporary swelling masks a minor deviation. If this is not possible a review 7-14 days after the injury, when the swelling has diminished is also appropriate. If there is any doubt about a fracture being present, pain/ discomfort on palpation over the nasal bones is a useful clinical sign. In adults, if the nasal bones are non-tender 14 days after the injury, it is highly unlikely that a significant nasal bone injury has occurred.

Subtle deformities, such as depression of a nasal bone or an upper lateral cartilage, are more easily recognisable if one covers one side of the nose and then compares it to the other. This is illustrated in the pictures below.

### **Radiology or X-rays:**





The value of simple nasal X-rays in the diagnosis of nasal fractures is limited. They continue to be done routinely and patients often feel that their treatment is not adequate, unless they have had a nasal bone X-ray. In reality, they are a poor diagnostic aid. Previous fractures may be seen, vascular markings are easily confused with a fracture, and they fail to document any cartilaginous injury. They are only useful if one is also looking for other facial bone injuries.

## Grade I fractures



This results from a glancing blow of moderate force. The apparent deviation is due to depression of the bone fragment, causing loss of the smooth line running from the radix to the tip defining

point. Frequently there is an associated depression of the upper lateral cartilage on the same side. The depressed fragment is easily elevated. An underlying pack may be placed to prevent recurrence. Depending on the patient, this is sometimes best done under a general anaesthetic. If the upper lateral cartilage is also depressed, the patient should be warned that the bone fragment has a tendency to drift back towards its previous position.

## Grade II fractures



With greater force, lateral displacement of both nasal bones occurs. The nasal bone fracture lines run parallel to the dorsum (bridge of the nose). The ipsilateral nasal bone (nasal bone on the same side) to the force fractures to and immediately above the nasal maxillary suture running up to the thick part of the nasal bone. The contralateral nasal bone (nasal bone on the other side) fractures parallel to and immediately below the dorsum. A fracture line connects the two described fracture lines across the midline, where the nasal bone changes from thick to thin. A bone fracture also occurs in the perpendicular plate of the ethmoid bone, which is a midline bone in the middle of the internal nose.





## Grade III fractures (above)

More extreme lateral displacement of the nasal bones occurs. The nasal bone fracture lines run parallel to the dorsum (bridge of the nose). The ipsilateral nasal bone (nasal bone on the same side) to the force fractures to and immediately above the nasal maxillary suture running up to the thick part of the nasal bone. The contralateral nasal bone (nasal bone on the opposite side) fractures to, but some distance below the dorsum. A fracture line connects the fractures across the midline, where the bone changes from thick to thin. A reverse C shaped fracture involving the perpendicular plate, the vomer and the cartilaginous septum occurs. This internal fracture in the middle of the internal nose may have to be corrected with surgery (called a septoplasty) under general anaesthetic.

## Grade III fractures and treatment

The nasal septum (internal wall in the middle of the nose) influences the position of the dorsum (bridge of the nose). This fracture is common in the fracture prone individual involved in contact sports. Simple manipulation of this type of fracture under local anaesthetic obtains an adequate result in approximately 80% of cases. The middle picture illustrates the result of simple manipulation. To obtain an optimal result correction and reconstruction of the fractured septum in the middle of the internal nose is obligatory. This has been done in the picture on the right side under a general anaesthetic.

## Cartilaginous trauma

Trauma does not necessarily involve the bony part of the nose - isolated septal fractures (fractures in the internal cartilaginous wall in the middle of the nose) and disruption of the attachment of the upper lateral cartilage to the nasal bones may also occur. The upper lateral cartilage is the semi-mobile structure below the nasal bones. It can be torn away from the nasal bones. Fractures in the middle of the internal nose can be easily missed in the acute situation, and are only recognised when the patient presents later with a blocked nose. A tearing of the upper lateral cartilage away from the nasal bones may also be missed in the acute situation at the initial consultation, as it may be hidden by swelling and bruising of the associated soft tissues.

## Treatment of nasal fractures

A doctor's assessment of nasal appearance and function may not always correlate with patient satisfaction. The wish of the patient should be the first consideration. A model wishes perfection, whereas a rugby player may be less critical. Females are often more concerned about minor cosmetic defects than males are. If there is a high risk of further injury and treatment is requested, simple manipulation is the most cost effective option. Open reduction of an associated fractured septum improves the final result, but may weaken the septum should further injury occur. Any major surgery is best deferred until the possibility of further injury is reduced, particularly in "accident prone" young males.

The risks of nasal fracture reduction need to be discussed with the patient. In adults, a nasal fracture may be manipulated into position at any time up to three weeks after the accident. However nasal fractures in children may need manipulation as early as 4 days after an injury, because they heal quickly. Sometimes these fractures are difficult to assess, because of the associated soft tissue swelling. By the time the swelling has gone down the nasal bones may have healed, and become firmly fixed.

## Results of simple manipulation

Type I fractures are rare; the bone fragment tends to drift back after simple manipulation. Type II and Type III fractures are common. Type II fractures tend to do well with simple manipulation under local anaesthetic. If there is a septal (internal wall in the middle of the nose) injury, as in Type III fractures, there is an 80% chance of the reduction being successful.

## How I manipulate nasal fractures under local anaesthetic

*I have now reduced over 1,000 nasal bone fractures under local anaesthetic. I suspect that this is one of the largest experiences in Auckland.*

Firstly, it is important to define the original injury. Most nasal bone fractures are Type II and Type III fractures. Local anaesthetic is injected into the presumed nasal bone fracture sites. This is usually very well tolerated and I have developed a number of techniques over the last two decades, which help me distract the patient. I take a considerable time injecting the local anaesthetic and also give the local anaesthetic time to work. I then apply a force using my hands in an

opposite direction to the original force. Reduction of the nasal bone fracture is usually the least painful part of the procedure. There is no further bruising, and the patient is able to drive home afterwards. The local anaesthetic wears off slowly afterwards over 20 minutes. There is also minimal pain after the local anaesthetic has worn off. If it is uncomfortable the discomfort is usually easily controlled with simple pain relief such as Paracetamol. If there are any concerns or worries then I arrange to review the patient 4-6 weeks after the nasal fracture reduction.

## Nasal casts

Although many people still use a cast on the nose for a week after simple manipulation, there is no evidence that they work! It may be useful to prevent pain if people knock their nose after the reduction. It takes 6-8 weeks for the bones to heal, and they can still be displaced over this time. If you break an arm or a leg, a cast is put on for longer than a week!