

***Comparison between High- Resolution
Ultrasonography and Conventional
Radiography in the Diagnosis of Nasal
Bone Fractures***

A thesis

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Abstract

Background:

Nasal bone fractures are the most common among facial fractures and are the third most common fractures in the human skeleton.

The classical clinician approach to the diagnosis of nasal bone fracture is to rely on two hard clinical signs (crepitation and mobility) or to suspect nasal bone fracture based on history of trauma and other less specific signs (nasal swelling, deviation and asymmetry, epistaxis, periorbital ecchymosis, and a specific point of tenderness) in addition to a positive finding on conventional radiography. It is known that conventional radiography is associated with false positive and negative results. Using high resolution ultrasonography with 7.5MHz linear array transducer is tested as an alternative to radiography in the diagnosis of nasal bone fractures.

Objectives:

To describe the diagnostic findings of ultrasonography in nasal bones fractures and to determine the validity of classical clinical practice assisted by radiography in the diagnosis of nasal bone fractures and compared it to the value of ultrasonography.

Subjects and methods:

A total sample of 53 patients (11 females and 42 males) at age range (14-40) years, with a differential diagnosis of nasal fracture based on history of nasal trauma and physical signs and symptoms of nasal bone fracture. All subjects had a true lateral soft tissue profile view of the face and high resolution ultrasonography in addition 8 subjects had an occipitomental view based on physician request. The radiographs and ultrasound images of each subjects were analyzed and reports were recorded as either “positive” or “negative” according to the existence of nasal bone fracture with other details about the fracture if present (number of the fracture lines detected, the type of the fracture, its

location and assessment of the soft tissue swelling and hematoma). The results were analyzed by various statistical testing methods (for sensitivity, specificity, positive and negative predictive value, and accuracy).

Results:

The sensitivity to established clinical diagnosis (based on crepitation and mobility) in diagnosis of nasal bone fracture was 76.6% (23.4% false – ve rate). This figure is increased to 89.4% (10.6% false – ve rate) when clinical decision is aided by radiography. Such a practice however is associated with low specificity (33.3%). Using ultrasonography will increase both sensitivity and specificity to 100%.

Conclusion:

The ultrasonography in diagnosis of nasal bone fracture is superior to radiography and it is recommended to shift the classical clinical approach from radiography to ultrasonography in this context.