

Detection of Maxillofacial Fractures at Primary Trauma Care Centres using Simple Tool - Wooden Bite Blade

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Abstract

In developing countries like India where still large mass people are not much aware about the safety measure to protect head and neck region. High proportions of maxillofacial trauma have been noted at triage of casualty till date, however due to the absence of expertise of maxillofacial region to diagnose a maxillofacial trauma which posing airway obstruction in fracture of mandible and other serious injuries in maxillofacial area. Tongue blade test being unique, quick and fairly accurate in diagnosing fracture in maxillofacial region and could be compared with imaging modalities post stabilization of injured patient. It can be performed easily by clinician who is not having expertise in maxillofacial region and paramedical staff who are in the triage area.

Keywords: Computed Tomography (CT); Mandibular Fracture; Tongue Blade; Orthopantomograph; Road Traffic Accidents (RTA); Lefort Fracture; Zygomatic Fracture

Introduction

Maxillofacial fractures have been observed in high proportion in cases of facial trauma (30-70%) [1,2]. Reasons attributed for such cases predominantly include road traffic accident and interpersonal trauma. In the developing parts of the world, the former cause is seen predominantly. It is also to be realized that further development of human civilization is going to involve more of travel, exposing us to this risk in higher proportion [3]. When maxillofacial fractures are reported to the trauma care center, various investigations are performed to ascertain the location and extent of the fracture. The investigations have developed in conjunction with technological development, enabling accurate diagnosis and prognosis. These may include radiography, computerized tomography and so on [4]. While such investigations may be high in accuracy, they consume a considerable time and are considered expensive in developing countries. In wards

where there are huge numbers of cases, waiting time in the out-patient ward is of considerable importance. This delay may lead to consequences of irreparable nature such as disfiguration. Although delayed treatment of maxillofacial fractures have not been shown to influence healing, these are complications that can be avoided to save the burden of medical expenditure [5-8]. Also, these techniques may not be suitable for quick screening in the ward. In cases where there is a contraindication of radiation, it may be used to diagnose.

Materials and Method

A prospective study was conducted for period between November 2018 to December 2019 in patients with maxillofacial trauma reporting to casualty units of Government District Hospital, Davanagere and Department of Oral and Maxillofacial Surgery, College of Dental Science and hospital, Davanagere, Karnataka. Were

screened and assessed for maxillofacial fractures using disposable wooden tongue blades. The individuals of suspected jaw fractures were asked to bite on the tongue blade and surgeon would try to turn the blade towards the tongue and if it breaks it's a negative tongue blade test whereas if the individuals bite force insufficient in breaking it would be considered a positive tongue blade test considering the fact that due to pain in the fractured segment the patient was unable to break the tongue blade.

- **Inclusion Criteria:** 1. All dentate patients reporting to casualty units with maxillofacial trauma.
- **Exclusion Criteria:** 1. Edentulous patients, 2. Individuals with head injury concomitant with facial fractures, 3. Unconscious Individuals, 4. Individuals with injury to other vital organs.

Materials

Disposable wooden tongue blades.

Results

The study population consisted of 210 individuals of whom most of them belonged to 16-25 years and 26-35 years. In this study 170 males and 40 females were included, most frequent cause of trauma is road traffic accident, followed by self-fall. In this study most of the fractures were in parasymphysis and condylar region. In case of ANGLE fractures, sensitivity was 0.9. In case of ANGLE and BODY fractures, sensitivity was 1. In case of ANGLE and PARASYMPHYSIS fractures, sensitivity was 1. In case of BODY fractures, sensitivity was 1. In case of BODY and PARASYMPHYSIS fractures, sensitivity was 1. In case of BODY and RAMUS fractures, sensitivity was 1. In case of CONDYLE fractures, sensitivity was 1. In case of CONDYLE and PARASYMPHYSIS fractures, sensitivity was 1. In case of DENTOALVEOLAR fractures, sensitivity was 1. In case of MIDSYPHYSIS fractures, sensitivity was 0.5. In case of PARASYMPHYSIS fractures, sensitivity was 0.9. In case of ZMC fractures, sensitivity was 1.

Discussion

Mandibular fractures are one of the most frequent maxillofacial fractures encountered in the facial trauma and are mainly caused by road accidents. The most common clinical features may include but not limited to malocclusion and loss of mandibular function. Usually, panoramic radiography is performed in isolated lesions, while computed tomography is used for other suspected types of

fractures. Therapeutic options may be a conservative approach or surgical treatment, which is dependent upon the anatomic area and the severity of fracture. The main purpose of this study is to analyse the use of tongue blade test in screening and part confirming the mandibular fracture. Tongue blade, also called tongue depressor is a very common piece of instrument in the surgical setup and is commonly used for many applications. It is used for instant pharyngoscopy, to test gag reflex, examine tender teeth, dislocated jaw reduction etc. In many cases of reduced mouth opening, it is used to deliver certain drugs into oral cavity. Since the instrument is simple and cheap, many innovative uses can be found. It can be used to control epistaxis and a rigid piece of disposable instrument. Further, it can be used to obtain cytological samples from mucosae. Summarily, since the tongue blade is commonly available everywhere, if it can be used to diagnose, it becomes the most useful tool in any clinical scenario. While gold standard for arriving at the diagnosis is the CT scan, the time consumed to perform it in an emergency condition, higher cost, and radiation exposure can be some factors disabling the use of CT scan [9,10]. Further, in certain specific cases, where there is no availability of medical care, some alternative screening technique assumes prime importance. Even in a well-equipped medical facility, preliminary elimination can avoid a lot of time loss and thereby facilitate Tongue blade test being easy technique and could be performed rapidly by any personnel available at the emergency triage to diagnose maxillofacial fractures with the use of simple wooden tongue blades. Unavailability of literature about the relative accuracy of tongue blade test in giving primary diagnosis of fracture in maxillofacial region, our study aims to assess the accuracy of the tongue blade test in patients with maxillofacial trauma in casualty units. Mainly to screen diagnose mandibular fractures before subjecting the patient to the imaging modalities. Still other imaging modalities such as computed tomography and orthopantomograph are gold standard in arrival of diagnosis of fracture in maxillofacial region, further in certain remote places where these imaging facilities are not available tongue blade test assumes a prime importance in making primary diagnosis and to resuscitate the injured patient primarily for further speciality referral and proper treatment plan for the injury. In this study 5 cases showed disagreement between tongue blade test and actual diagnosis. One case of angle fracture showed negative tongue blade test but positive diagnosis. Similarly, one midsymphysis fracture

and one parasymphysis showed negative tongue blade test but actual diagnosis was positive. Other false positives were in cases of zygomatic complex or lefort fractures. Overall, sensitivity of the test was above 95% but specificity was low. Obviously, dento alveolar fractures can readily be revealed from tongue blade test as the test itself occurs in the fracture region. However, in maxillary or zygomatic fractures, they may present as positive tongue blade test, with absent mandibular fracture. This may be because of the muscle attachment to the zygomatic arch and mobility of fractured maxilla. With regard to the condylar region, any damage can readily be realized in tongue blade test. In case of unilateral condylar fracture, tongue blade test may be positive on the side of fracture. In such cases, deviation of mandible serves as a clear guidance to clinch the diagnosis.

Conclusion

In countries like India which is predominantly rural, the knowledge of first aid and immediate clinical attention is not widespread. In such a scenario, though the governing authorities are striving to reach these locations, it may still need some self-sufficiency. If local health-care providers, nongovernmental agencies, voluntary groups can be educated on this simple test, it would allow them to provide timely help to people who have suffered trauma. By analysing the results, it is found that the tongue blade test can be a suitable preliminary screening tool that can be used widely. It is worthy of being added in the diagnostic armamentarium. Accuracy of tongue blade test is determined by the location of fracture. Though useful in emergency, it is no way a conclusive test to map the fracture site or line.

Armamentarium

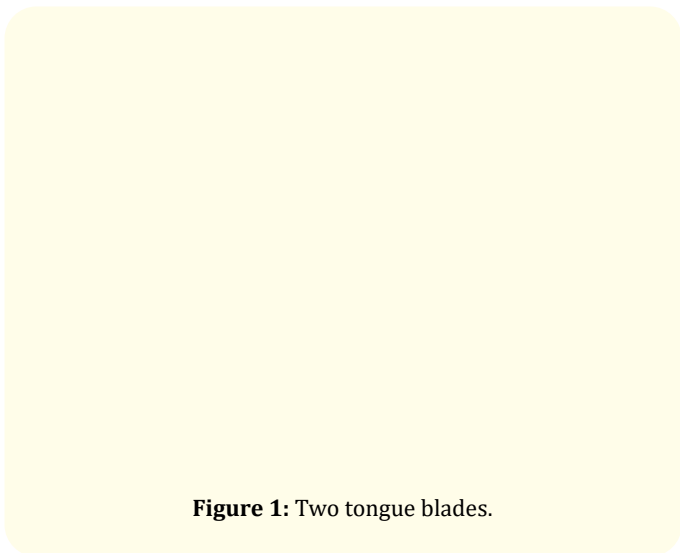


Figure 1: Two tongue blades.

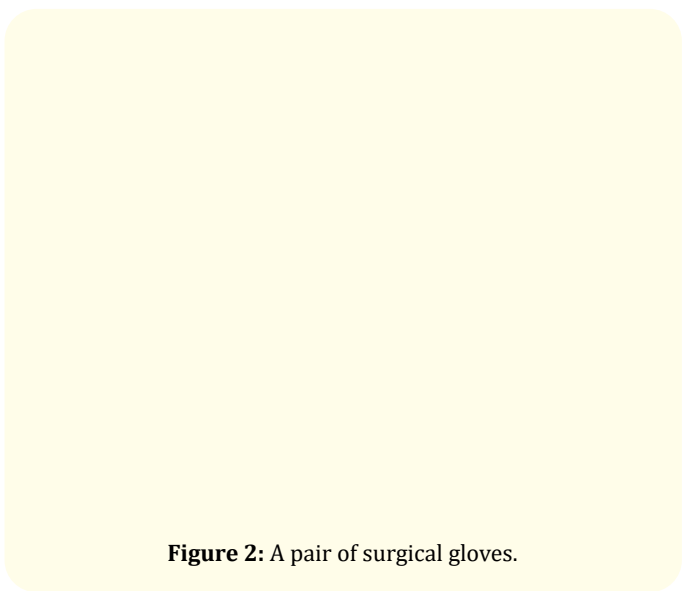


Figure 2: A pair of surgical gloves.

Case samples

A 31-year-old male patient with right side body fracture of mandible.

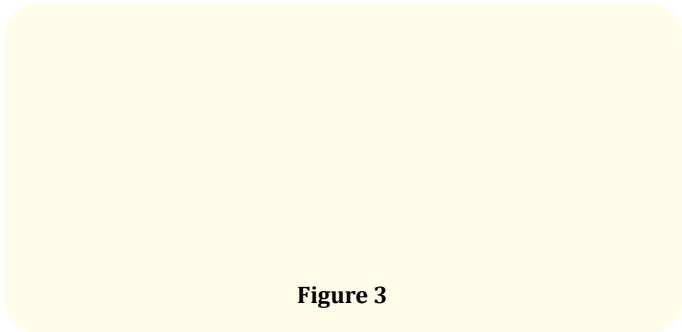


Figure 3

The tongue blade can be broken on the left side and not on the right. This implies a positive tongue blade test.

A 25-year-old male patient with bilateral condylar fractures of mandible.

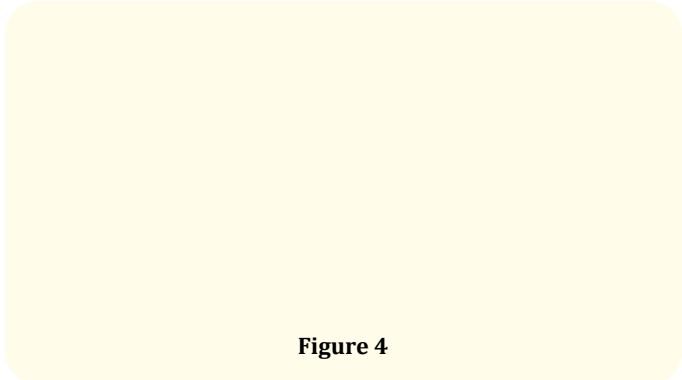


Figure 4

The tongue blade cannot be broken on both the sides. This implies a positive tongue blade test.

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