

Dentistry 2019: A study on the ability of CBCT in the detection of different sizes of projectiles caused by a car accident in the maxillofacial region

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The purpose of this study was to evaluate CBCT's sensitivity for detecting foreign bodies in different sizes and materials in three anatomically important areas of the maxillofacial region. Four different materials were used in this study including metal, glass, rubber and wood. Particles were prepared in 4 different sizes from 1*1*1 mm (length, width, height) to 4*4*2 millimeters. Foreign bodies were then placed into a sheep's head in infratemporal, infraorbital and sublingual regions. CBCT was performed and then observed by 11 observers. CBCT clearly detected metallic and glass particles in all areas and rubber projectiles larger than 1*1*1 mm were detected in most areas. For wooden particles, there was a lot of controversy and CBCT didn't seem to be reliable for detecting them in the infratemporal area. Larger particles were better detected in the infraorbital and sublingual area as well. CBCT can replace CT scans for detecting metallic and glass and some rubber and wood foreign bodies in the maxillofacial region and has the benefit of reducing patient's dose of X-ray and cost less than CT. To get ideal results, it would be necessary to use ultrasonography for superficial radiolucent particles and CT scans for deeper ones.

In this in vitro study, iron, glass, stone, wood, asphalt, and tooth samples measuring $0.1 \times 0.5 \times 0.5$ cm were placed within the tongue muscle, soft tissue-bone interface and cavity during a fresh sheep's head and subjected to MRI, US, CT and CBCT. a complete of 20 images were captured by each imaging system from the six materials within the afore-mentioned locations. the pictures were observed by an expert oral and maxillofacial radiologist and a general radiologist. To assess reliability, 20 images were randomly observed by the observers in two separate sessions. the pictures were classified into three groups of excellent visibility, bad visibility and invisible. the info were analyzed using SPSS version 18, Wilcoxon Signed Rank, Pearson chi square, and Fisher's exact tests. Background and aims. The imaging techniques commonly used for foreign body detection include plain radiography, xeroradiography, computerized tomography (CT) scans, resonance imaging (MRI) and ultrasonography.

The aim of the present study was to compare cone-beam computed tomography (CBCT) with conventional CT scan in determination of the exact location of a foreign body in the maxillofacial area in vitro. Materials and methods. In this descriptive study, seven different materials were selected as foreign bodies with dimensions of approximately 2 mm, 1 mm, and 0.5 mm. These materials consisted of metal, glass, wood,

stone, plastic, graphite and tooth. These foreign bodies were placed in a sheep head between the corpus of the mandible and muscle, in the tongue and in an air space. One conventional CT scan and two CBCT scans were made on the models. Results. Tooth, metal, stone and glass foreign bodies were seen clearly on CT and CBCT scans made by NewTom at the smallest size in air.

However, CBCT scan by NewTom was a more effective technique for visualization of foreign bodies in air compared to conventional CT. Foreign bodies measuring 0.5 mm made of metal, stone, glass, graphite and teeth were detected by all devices in muscle tissue and adjacent bone.

According to the results, CBCT scans of NewTom and Planmeca are appropriate tools for detecting foreign bodies with relative high density in the maxillofacial area.