

The detection of experimental abnormality on the floor of maxillary sinus using two different radiographic techniques

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Abstract

The aim of this study is to confirm the ability of digital panoramic (program 20 sinus projections) in detection of maxillary sinus disease.

The represented of radiopaque mass at the floor of maxillary sinus of a dry skull was compared in digital Water's and panoramic (programs 20 sinus) projections.

The mass with a diameter of 10mm situated on the floor of the maxillary sinus.

The radiopaque mass was shown better by digital panoramic (program 20 sinus projection), while the digital Water's projection was less effective.

the digital panoramic (program 20 sinus projections) proved more effective in detection masses on the floor of maxillary sinus than digital Water's projection where it's not clearly detected due to superimposition of maxillary molar teeth

Key wards: Maxillary sinus, digital panoramic radiography.

Introduction

Recent technologic advances have produced a significant impact on the field of dental radiography; such advances in computed technology have resulted in a unique (filmless) imaging system known as digital radiography.

Since its introduction to dentistry in 1987 digital radiography has influenced both how dental disease is recognized and how its diagnosed¹.

Maxillary sinus is usually examined radiographically with the Water's projection, although some lesions, such as the mucous retention cyst, postoperative maxillary cyst, and maxillary sinus carcinoma, as well as lesions extending into the maxillary sinus, maybe adequately shown by panoramic radiography². However, the images of radioopacity in maxillary sinus in simultaneous Water's and panoramic projections rarely correspond.

Ohba³ study the difference between conventional Water's and panoramic projections by applying 7 mm thick layers of radiopaque oil – clay to the internal surface of maxillary sinus, he found beam angulations was shown to be a significant factor in this difference.

In the present study we investigate the difference between the two projections in representation of radiopaque mass in the maxillary sinus.

Materials and Method

Radiopaque oil – clay mass with diameter of 10mm was used as the experimental lesion. It was placed on the floor of right maxillary sinus of a dry skull and its representation was compared in digital Water's and digital panoramic (program 20 sinus) projections.

Both projections were done with dimax 3 digital planmeca x-ray machine fig.1 where the digital Water's projection was performed at 78 kVp and

12 mA, and the skull was positioned until Alar – tragal line at an angle of 35° – 40° upward from the horizontal.

Digital panoramic (program 20 sinus projections) was performed at 70 kvp and 6 mA with Frankfort plane parallel with Frankfort light using chine support.

When a mass was placed in its position on the floor of the maxillary sinus the radiographic projection was taken.

Results and Discussion

The results of a comparison of the two digital radiographic projections in the detection of radiopaque mass on the floor of maxillary sinus show that:-

From the radiographic examination of these two projections, the digital Water's projection was less effective in showing this mass on the floor of the sinus.

In contrast, digital panoramic (program 20 sinus projections) appear more clear in detecting this mass on the same situation fig 2, 3. So for the detection of radiopaque lesions in the maxillary sinus it was noted that, the experimental radiopaque mass on the floor of maxillary sinus was clearly demonstrating by digital panoramic (program 20 sinus projection) especially at the posterior region of the floor while on the digital Water's projection it's not clearly demonstrated because of super - imposition of maxillary molar teeth.

The difference between the two projections is related to the difference in angulations of the central ray in relation

to the position of the mass in the sinus' in Water's projection the central ray is projected parallel to the medial wall and consequently the anterior and posterior walls are superimposed on each other .In panoramic projection on the other hand, the central ray is approximately perpendicular to the medial wall and the anterior and posterior walls are superimposed on it⁴.

Conclusion

In clinical practice, from diagnostic point of view Water's projection is the examination of choice for maxillary sinus disease. However, it seems from this study that it is less effective for detection of radiopaque masses on the floor of maxillary sinus especially at the posterior region where it's not clearly demonstrated due to superimposition of the maxillary teeth.

References

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Figure 1:- dimax 3 digital planmeca x-ray machine by which both projections were done.



Figure 2 :- radiographic image shows radiopaque mass at the floor of maxillary sinus on digital panoramic (program 20 sinus projection).



Fig 3: Radiographic image show the radiopaque mass at the floor of maxillary sinus on the Water's view