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USE OF PNS VIEW AS A DIAGNOSTIC RADIOGRAPH AMONG PATIENTS VISITING A PRIVATE DENTAL COLLEGE

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Abstract
Objective: New digital two-dimensional imaging systems are considered as an easily accessible modality for sinonasal evaluation. The aim of this study was to determine the use of PNS view as a diagnostic radiograph among the patients.
Materials and Methods: Study samples of 24 cases were obtained from the data of 86000 patients between March 2020 and March 2021. Statistical software used for analysis was the SPSS(statistical package for the social sciences) which is designed by IBM and the statistical tests used were frequency tables along with bar graphs to analyse and compare the obtained results. The obtained data was tabulated in excel systematically. Data was then entered in the SPSS analysis software and descriptive analysis and correlation statistics performed. The obtained results were tabulated and graphically represented.
Results: Results from the study reveals that the use of PNS view as a diagnostic radiograph among the male population 75% and among the female population is 25%; distribution of PNS radiograph among various departments reveal 66.6% in oral & maxillofacial surgery;16.6% in Implantology and 16.6% in oral medicine. Further assessment of PNS view revealed about 33.3% of the male population used PNS view as diagnostic radiograph in zygoma fracture and 20.8% of the male population used PNS view for fracture in the orbital floor and to view the maxillary sinus. The correlation between the Gender and the use of PNS view revealed that Pearson Chi-Square Value-0.307;p>0.05. Hence statistically not significant
Conclusion: This study reveals that PNS view were found to be the most frequently used as diagnostic radiograph among male population. The findings of the present study showed that the use of PNS view was commonly used for zygoma fracture in the department of oral and maxillofacial surgery.
Keyword: PNS X-Ray; Zygoma fracture; Diagnosis; Paranasal sinus.

INTRODUCTION

Radiographs of paranasal sinuses are frequently taken in patients with obvious nasal pathology to rule out concomitant sinus disease, with equal frequency they are demanded by both general practitioners and patients who do not have apparent nasal pathology like patients with chronic headache, chronic cough, secretory otitis media,deviated nasal septum, zygomatic fractures,orbital floor fracture and to examine the maxillary sinus (Ellstrom and Evans 2013).Historically, plain radiographs detected large and often displaced fractures, but small defects commonly went undetected. The Waters view of the skull shows a well-developed frontal sinus with its scalloped superior border but does not demonstrate significant detail. Sinonasal inflammatory disease is usually considered as the most common illness in the World. Acute and chronic rhinosinusitis are the most prevalent diseases in this category(Braun et al. 2003). Many predisposing factors such as anatomical anomalies, allergy and inheritance can make an individual prone to chronic rhinosinusitis. Nasal septum deviation is also associated with chronic sinusitis and is usually accompanied by nasal obstruction, hypernasality and various degrees of anosmia.PNS radiograph plays a fundamental role in the diagnosis of sinonasal inflammatory diseases(DeFranco et al. 2007). It is a traditional method for evaluating sinonasal area. They are favorable for their availability, ease of use, low radiation dose and low cost.Although it is generally accepted that PNS view(Water's view) is the gold standard modality for sinonasal imaging(Zycinska et al. 2010).The numerous features of image enhancement in digital imaging, alongside lower radiation dose may represent digital plain radiography as a simple and acceptable modality in this field.Waters' view showed high sensitivity and specificity in detecting the opacified maxillary sinuses and detected thickened mucosa in 154 sinuses and showed higher sensitivity than specificity.PNS (Zycinska et al. 2010)view is based on the presence of air in the sinuses. Any change in air content or alteration in translucency caused by any pathology or physiological process, is reflected in the radiograph. Sinus X-rays may appear normal or show evidence of infection in the form of mucosal thickening, fluid levels or total opacity.Plain radiography has a limited role in the

management of sinusitis. Possible findings in acute sinusitis include mucosal thickening, air-fluid levels, and complete opacification of the involved sinus. Although mucosal thickening is seen in more than 90 percent of sinusitis cases, it is very nonspecific.Radiographs of the sinuses in infants aged three years or younger are not useful because of false "opacification" from undeveloped sinuses(von Arx et al. 2014).Other important limitations of plain radiographs include poor visualization of ethmoid air spaces and difficulty differentiating between infection, tumor, and polyp in an opacified sinus.The diagnosis of facial fractures is supported by radiographic techniques after an accurate clinical exam. In Accident & Emergency departments (A&E) four or five radiographs often are taken, which increases clinical time, costs, and radiation exposure. The most used radiographic view is the occipitomental view (OM), which was first described for facial sinus and allows evaluation of the orbital floor, zygomatic processes, buttress, and arches. Recent literature has suggested the use of the OM view as a single radiographic exam for initial patient screening, reducing radiation exposure, clinical time, and costs without compromising the identification of midfacial fractures(Warin et al. 2024). However, the Water's technique generates bone image superimposition at the inferior midface, preventing perfect visualization of this region. A single PNS view appears to provide as much information as the standard four-view series. The aim of this study was to determine the use of PNS view as a diagnostic radiograph among the patients.

MATERIALS AND METHODS

Study setting

This study was carried out in a university setting which consists of subjects predominantly South Indian population. Advantages of the study include available data and similar ethnicity. Disadvantages of this study is the fact that it is a unicentre study and the geographic locations trends are not assessed. Approval of the study is by the ethical board of Saveetha university. Number of people involves 3 reviewers. A Guide, Researcher and a reviewing expert.

Sampling

This is a retrospective study in which the samples were considered from the time period of March 2020 to march 2021. Case sheets reviewed for the research include patients who used PNS as a diagnostic radiograph. Cross verification of the required samples was done by the reviewing expert. Measures were taken to minimize the sampling bias. These are inclusion of only clear and readily available data followed by simple random sampling. Both internal and external validation was also obtained to carry out the study.

Data collection / Tabulation

Data required for this study was procured by reviewing the patient records of about 86000 patients visiting the dental college. The samples were collected from March 2020 to March 2021. Dental Information Archiving Software is the database system used in college to record all the details of the patient, which includes their demographic data, photographs, diagnosis and treatment reports The required data i.e, patients with smoking habits were collected and entered in a methodical manner in an excel sheet for the tabulation of data and further statistical analysis data was validated by 1-2 external reviewers and all the non specific, unclear or incomplete data were excluded from the study.

Analytics

Statistical software used for analysis is the SPSS(statistical package for the social sciences) which is designed by IBM and the statistical test used were frequency tables along with bar graphs to analyse and compare the obtained results. Independent variables include ethnicity and age. Dependent variables include Gender and the use of PNS view.

RESULTS AND DISCUSSION

Out of total sample size (24 cases),Results from the study reveals that the use of PNS view as a diagnostic radiograph among the male population 75% and among the female population is 25%[Figure 1]; distribution of PNS radiograph among various departments reveal 66.6% in oral & maxillofacial surgery;16.6% in Implantology and 16.6% in oral medicine[Figure 2]. Further assessment of PNS view revealed about 33.3% of the male population used PNS view as diagnostic radiograph in zygoma fracture and 20.8% of the male population used PNS view for fracture in the orbital floor and to view the maxillary sinus. The correlation between the Gender and the use of PNS view revealed that Pearson Chi-Square Value-0.307;p>0.05. Hence statistically not significant[figure 3]. Ritter et al., In his study about 75% of patients (n=204) had some degrees of nasal septum deviation. Waters' and Caldwell's views correctly diagnosed 172 and 178 cases, respectively. Both views performed well in this regard.Similar results were found in a study by Baek et al., where unilateral and bilateral zygoma fractures formed 69.3% of total cases (88). They showed that accuracy of CT in detection of fracture ranged from 66% to 76%. They found Water's view was 90% accurate in detection of these fractures and missed detecting none cases of simple fracture. Similar findings were not recorded in our study. Bruno et al., In his study Water's view is taken with maximum mouth opening, which allows proper evaluation of the inferior midface and the visualization of transversal palatal fractures.However,there were a few limitations encountered in this study. This study contained some data that were unclear of certain reporting parameters such data were not considered. Another limitation was the geographic limitation i.e.,assessment of predominantly South Indian population. Further this study is an unicentered study. Future research should focus on panel data to better understand the use of PNS view. The scope of this study is that the knowledge and the use of PNS view as a diagnostic purpose is essential for a dentist to detect fractures, maxillary sinus and to detect oronasal pathologies.

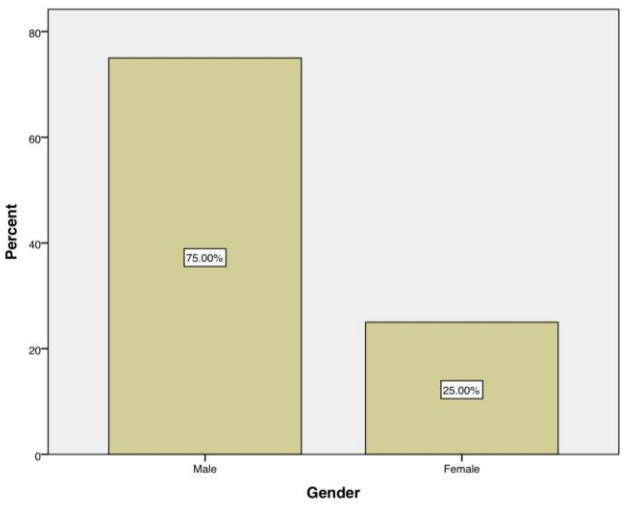

Figure 1

Figure 1:Bar graph showing the distribution gender with the PNS view across the sample size. x axis represents the gender and the y axis represents the percentage of participants who used PNS radiograph. Incidence of PNS view in male population is 75% and in the female population is 25%. This reveals that the PNS view is predominantly observed among male population.

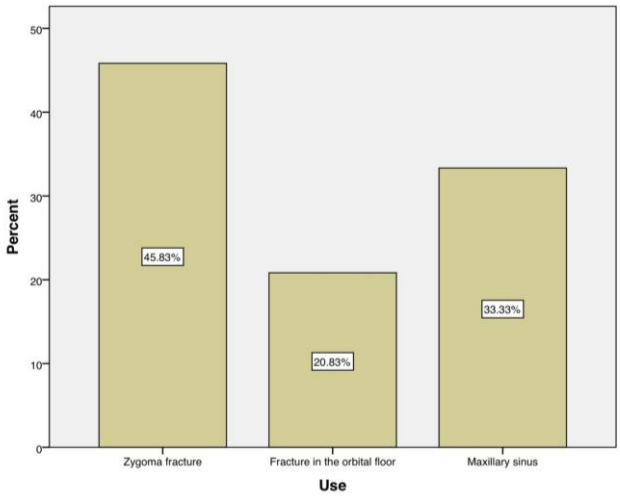

Figure 2

Figure 2:Bar graph showing the distribution gender with the PNS view across the sample size. x axis represents the use of PNS view and the y axis represents the percentage of participants who used PNS radiograph. Incidence of PNS view in male population is 75% and in the female population is 25%. This reveals that the PNS view is predominantly taken for Zygoma fracture.

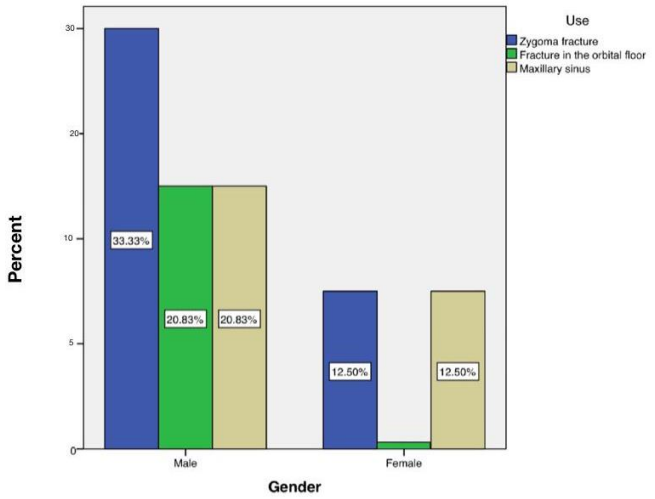

Figure 3

Figure 3: Bar graph depicting the gender and various uses of PNS view. X axis represents the gender and Y axis represents the various use of PNS view . Blue colour denotes Zygoma fracture and Green colour denotes fracture in the orbital floor and yellow colour denotes maxillary sinus.

CONCLUSION

This study reveals that PNS view were found to be the most frequently used as diagnostic radiograph among male population. The findings of the present study showed that the use of PNS view was commonly used for zygoma fracture in the department of oral and maxillofacial surgery.Therefore,this study emphasizes the need for more training programs about the uses of PNS view.

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