

# Comparative Study of Plain-film Radiographs of Maxillary Sinuses Between Radiologists and Clinicians

G Krishnan, FRCS

*Department of Otorhinolaryngology, Faculty of Medicine, University of Malaya, Kuala Lumpur*

## Summary

Maxillary sinuses plain film radiographs of 59 patients were reviewed and reported by both clinicians or Radiologists at the University Hospital, Kuala Lumpur. There was agreement in 52 reports of the plain film radiographs however there was partial differences in about seven cases. This gave an impression that the ENT specialist and the Radiologist were both capable of reporting plain film radiographs of maxillary sinuses, even though the radiologist has no opportunity of doing detail clinical examination of the patient.

Antibiotics used routinely in the treatment of sinusitis did not cause any significant changes in the outcome of the sinus disease.

*Key words:* Maxillary Sinusitis, Antral Washout.

## Introduction

Sinusitis means inflammation of the lining mucosa of the sinuses and maxillary sinusitis is a common condition seen in ENT practice. Most frequently it is an extension from a nasal infection.

Usually the symptoms of acute sinusitis are similar to those of upper respiratory tract infection, as they are usually non specific and not diagnostic of sinus pathology.

Radiographically sinus infection usually manifests as mucosal thickening of more than 3mm, sinus opacity, air-fluid levels and polyps. Plain film radiographs of the paranasal sinuses are one of the common methods used in the diagnosis of sinusitis.

A study was done at the University Hospital, Kuala Lumpur with the aim to compare the radiologist's and otolaryngologist's evaluation of the paranasal sinus plain film radiographs of patients with complaints which were suggestive of sinusitis, especially of maxillary sinusitis. The purpose of the study was to determine the ability of the clinicians themselves reporting the plain film radiographs of the maxillary sinuses by comparing them with that of the radiologist.

## Methods and Materials

59 patients with a clinical diagnosis of maxillary sinusitis were randomly selected from the out patient clinic at the University Hospital. These patients were seen by the specialists as well as by the post graduate trainees under supervision. The clinicians and the radiologists were not aware of the study. Patients underwent plain film radiographs of the paranasal sinuses routinely ie. lateral view,

occipitofrontal, occipitomenal views. In this study only the occipitomenal view was of help to visualise the maxillary sinuses. All these patients were treated with nasal decongestants and antihistamines. Antibiotics like sulphamethoxazole and trimethoprim combination or ampicillin were used for the more severe cases. The antibiotics were used to cover the usual pathogens like streptococci, pneumococci, etc. All these patients subsequently underwent antral washouts under local anaesthesia.

The clinician's report and radiologist's report of each patient's plain films was compared. The interval between the date of the plain film radiographs and antral washout was also noted together with the type of antral washout return.

## Results

Age distribution of the patients were from 15-60 years.

A total of 35 patients were given antibiotics whereas another 24 patients were not given any antibiotics as part of the treatment.

Washout findings were supportive in 52 cases of both the clinician's and radiologist's reports.

**Table I – Results of antral washouts**

Group	Clear	Pus/(Non Clear)	No. of patients
Antibiotic group	11	25	35
Non Antibiotic group	12	12	24
<b>Total</b>			<b>59 cases</b>

Interval between date of X Rays - taken and washout date.

Antibiotic group	–	14 – 56 days
Non Antibiotic group	–	14 – 84 days.

**Table II – Comparison of plain film reports**

Group	No. of Patients	In Agreement	Non Agreement
Antibiotic group	35	32	3
Non Antibiotic group	24	20	4
<b>Total patients</b>	<b>59</b>	<b>52</b>	<b>7</b>

## Discussion

Maxillary sinusitis is defined as inflammation of the mucosa lining the sinus cavities. In maxillary sinusitis there will not be any changes in the tissues adjoining the sinuses e.g. the face as there are very few venous channels connecting the mucosa to the tissue outside the sinus. Hence the diagnosis of a sinus infection only from plain film radiographs can be difficult as many other conditions can produce similar changes as in sinusitis e.g. loss in translucency.

The plain film radiograph findings of a clear sinus rules out significant pathology in the sinuses. Air-fluid level in sinus plain film radiographs suggests obstruction of the sinus opening and probably infection. If a mucosal thickening is seen there is roughly 50 percent chance of infection. An opaque sinus is abnormal especially in adults and older children – these findings are frequent and are an early detectable radiographic findings in the maxillary antra. One of the common signs must be of an abnormality found in routine radiography of the sinuses is mucosal thickening either uniform or discretely polypoidal. A thin white line of mucoperiosteum delimits the point of junction between the mucosa and the bony wall.

Decreased translucency of the plain film radiographs can also be artefacts depending on the angulation and other technical details of the procedure. Opacity can also be due to the blood in the sinuses or due to an antral washout fluid prior to the plain film radiographs being taken. Previous surgery on the sinus and scar tissue can also alter the translucency of the sinuses whereby it can diagnosed as sinusitis if a proper history is not available to the radiologists.

A diagnosis of sinusitis using the size of mucosal thickness as seen in plain film radiographs is not practical as it is technically a difficult procedure to produce plain film radiographs to the same scale (objectively). Mucosal thickening seen usually in sinusitis can be also be a sequel of previous disease – hence a diagnose of sinusitis can be made on a plain film radiographs of an asymptomatic patient. Radiologists will have difficulty in diagnosing sinusitis if inadequate or improper history or examination findings are supplied. At times a radiologist might be wrongly influenced from the history to make an inaccurate diagnosis. The causes discussed above could have influenced the diagnosis resulting in the difference between the radiologist's and clinician's reports in this study.

The clinician's evaluation and radiologist's report of the sinus plain film radiographs were in agreement in most of the cases as from the results shown except in seven cases where there was differences. Those cases with infected antral washout returns were useful as a guide in judging the accuracy of the plain film radiographs reports of clinicians and radiologists especially in cases where the report was of sinusitis.

However the fact that sinusitis reported in the plain film radiographs could have resolved and not be seen in the antral washout because of the antibiotics given or healed spontaneously should be taken into account in interpreting the results.

The findings of antral washouts were seen to support the – reports of both doctors and radiologists equally. However the sinus washout report was also not seen to be entirely favourable to clinician or radiologist in the remainder seven cases. Neither is the statistical significance notable because of the small number of cases. Moreover the phenomenon of observer error among experts is also well known in medical science especially when one is not only dealing with descriptions but also inferences in the study, and this can also explain the differences in the reports of the two groups.

Some writers feel that the clinician should review the radiographs as the radiologist may interpret many findings as sinusitis as he does not have the full history nor able to examine the patient unlike

the clinician<sup>3</sup>. In the opinion of some, otolaryngologists should definitely be in a better position to interpret radiographic findings after reviewing patients history and physical examination as well as being familiar with the pathophysiologic features and management of sinusitis. In this study there is no evidence to support the above opinion.

## References

1. Otolaryngology Paparella Paparella. Edition, 1980, Saunders Co.
2. Radiological Diagnosis of the Paranasal sinuses: Eric Samuel.
3. Manual of Otolaryngology – Head and Neck. Therapeutics (Arnold E Kat). 1986, Lea Febiger.