ORIGINAL ARTICLE

Frequency of Malignant Otitis Externa Using CT Scan in Uncontrolled Diabetics With Positive Aural Culture

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ABSTRACT

Background: Diagnosis of malignant otitis externa has always been a challenge for an otorhinolaryngologist. Various imaging studies can detect the disease, but these are expensive and are not routinely used. Out of these, the role of CT scan which is cheaper and easily available, has been studied and found successful by many authors. However, the results need validation.
Aim: To determine the frequency of malignant otits externa using CT scan in uncontrolled diabetics with positive aural culture for pseudomonas aerogenosa
Methods: It was a Cross sectional survey. The participants enrolled after taking consents from 50 patients of ENT Unit I, Jinnah Hospital, Lahore for the period of Six months: from 30-05-2009 to 30-11-2009. Fifty patients with uncontrolled diabetes mellitus and positive pseudomonas culture were enrolled. CT scans were done in all patients. CT findings suggestive of malignant otitis externa that included bony erosion, soft tissues, intracranial and extracranial involvement were noted. Diagnosis of malignant otitis externa was established based on CT findings. Data was collected on a specially designed Proforma. The data was analyzed by SPSS 20.
Results: A total of 50 patients had CT scan. Diagnosis of malignant otits externa was established in 36 (72%) patients based on CT scan findings. Bony erosion was noticed in all (100%) the patients in whom diagnosis of malignant otitis externa was established.
Conclusion: CT scan can be used for establishing diagnosis of malignant otitis externa. It is also an excellent modality in detecting bony erosions associated with malignant otitis externa
Key words: Malignant otitis externa, CT scan, Bony erosion.

INTRODUCTION

Although each ear can function independently, however, in a normal human being, it is a pair of ears that performs the function of hearing. Besides this, they also add to the beauty of the facial framework. The ears function by converting physical vibrations into a nervous impulse like a biological microphone. It is the external ear that amplifies and modifies the spectrum of the sound wave, the middle ear makes the most significant contribution to this process[1,2].

Sometimes the external ear loses its customary environment due to some problems like inflammatory conditions of the external auditory canal, with or without infection that leads to symptoms, which include, ear discomfort, itching, discharge and impaired hearing. [3] Most of the times, the conditions are treated successfully with symptomatic topical treatment but sometimes, the infections are invasive leading to bony and soft tissue destruction[3, 4].

Necrotizing external otitis, or malignant external otitis represents a form of complicated ear pathology that was initially described by Chandler[5]. This condition is termed as malignant because of its propensity to cause complication due to bony erosions and soft tissue destruction. Hence the term malignant must not be confused in a histological sense. Malignant otits externa is a life-threatening *Pseudomonas* infection of the external auditory canal and skull base, which occurs most commonly in elderly patients with uncontrolled diabetes mellitus and immunocompromized patients (HIV, steroids etc)[6].

In a study by Sudhoff H, et al, it was concluded that CT scan is superior to conventional radiography and polytomography in evaluating the progression of bone and soft tissue changes in malignant otitis externa, as 70% of affected individuals, demonstrate evidence of bone erosion on CT scan[7]. CT scans can be used to delineate inflammatory changes in soft tissues of middle ear and mastoid, the infratemporal fossa, the parapharyngeal space, and in the area of stylomastoid foramen where involvement of facial nerve usually occurs.[8] CT scanning also helps to clearly demonstrate the progression of bone erosion once significant demineralization has occurred[9].

This study helps to analyze the CT scans of patients in an attempt to identify diagnostic features of the disease and to establish the radiological features of both the detection, as well as its persistence or recurrence.

MATERIAL AND METHOD

It was cross-sectional survey ENT Unit I of Jinnah Hospital Lahore. The approval for this study was granted by administration of Jinnah Hospital, Lahore. The calculated sample size was 50 cases.

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Statistical Analysis: The data was entered in the SPSS version 10 and analyzed. The results were presented in the frequency table and proportions. The diagnosis of malignant otitis externa, age of the patient, computed tomographic finding were variable of interest. The outcome was measured in response to clinical and radiological findings like condition of the external auditory canal, bone remineralization after treatment, and soft tissue conditions in middle ear were variable of the interest and all were presented by frequency and percentage.

RESULTS

In this study there were a total of 50 patients included in this prospective case series. The mean age of the patient was 61.10±10.95 (range 40 – 80 years). There was only 1 (2%) patient whose age was under 40 years. There were 8 (16%) patients of age range of 41 – 50 years, 18 (36%) patients of age range of 51 – 60 years, 12 (24%) patients of age range of 61 – 70 years, 9 (18%) patients of age range of 71 – 80 years and 2 (4%) patients of age more than 80 years. Out of the total 50 patients in the study, there were 28 (56%) female patients and 22 (44%) male patients. The male to female ratio was 1:1.38. Based on the CT scan findings, malignant otitis externa was detected among 36 (72%) patients and among 14(28%) patients, malignant otits externa could not be detected.

Table 1: Distribution of patients by age (n=50)

Age (Years)	No.	Percentage
< 40	1	2
41-50	8	16
51-60	18	36
61-70	12	24
70-80	9	18
< 81	2	4
Mean±SD	61.10 ±10.95	
Range	40 – 88	

Fig: 1: Graphical Distribution with respect to Patients

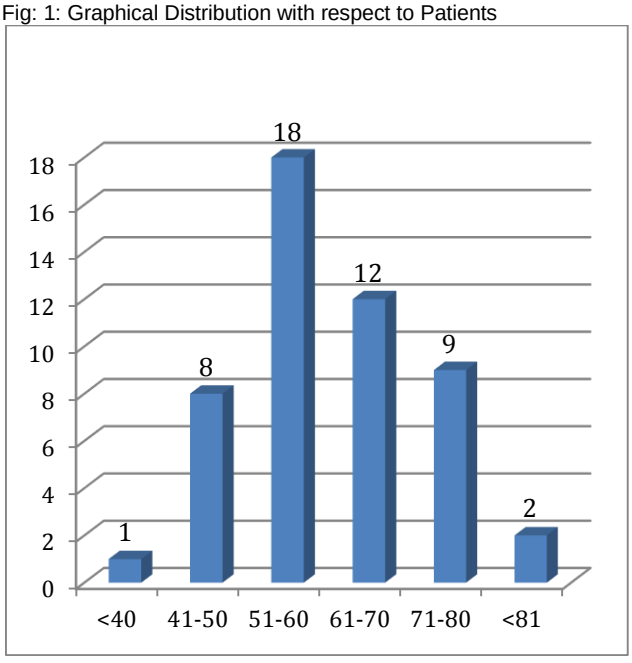


Fig 2: Graphical Presentation with Respect to Gender

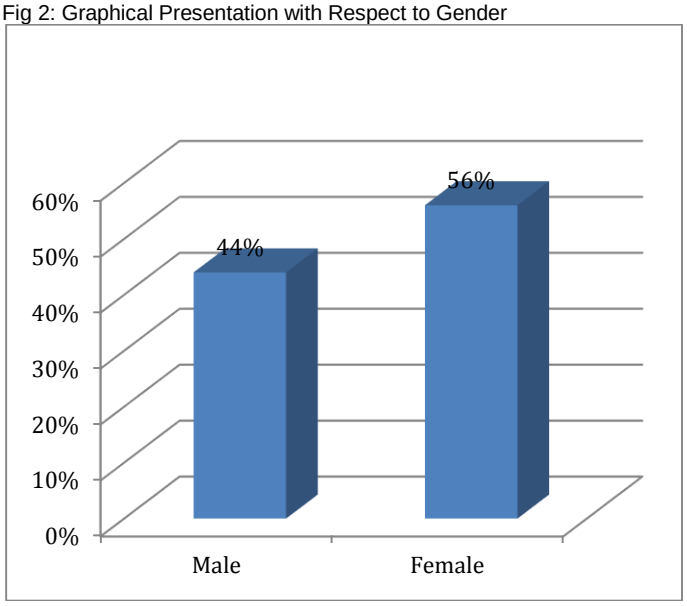
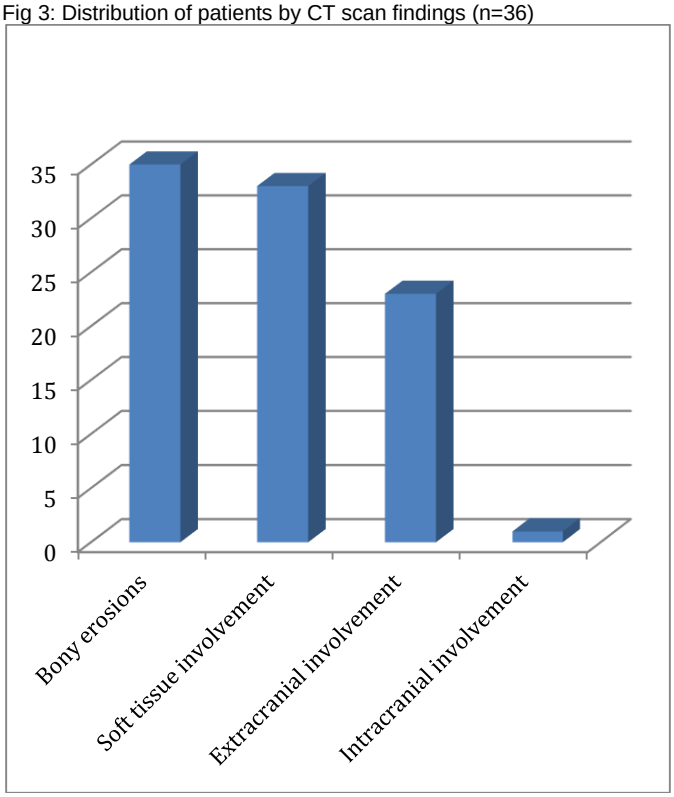


Fig 3: Distribution of patients by CT scan findings (n=36)



DISCUSSION

This prospective study was carried out to evaluate the frequency of malignant otitis externa detected on CT scan findings among the patients with uncontrolled diabetes with positive aural culture reports. This is probably one of the largest study (including 50 patients) which evaluated the CT scan findings among patients with otitis externa.

Before that, Sudhoff H et al[10] performed a study describing the usefulness of CT scan for detection of

malignant otitis externa among 23 patients. The sample size in our study was almost double than this study. Similarly, Soudry E, et al, [11] evaluated the role of CT scan in 48 patients. So, the results of our study are comparable to other studies in the world as we used a bigger sample size. Moreover, in this study, prospective data was analyzed, while both of the other studies were based on retrospectives data. This study was similar to these studies in matter of case selection. Cases in all the two studies and in ours were selected on almost the same criteria. Further, the outcome variable, i.e. CT scan findings were almost the same.

In this study, the mean age of the patients was 61 years in the range of 40 – 80 years. When compared to the other studies in the world, the average age of patients included in our study was less than the other studies. It was 71 years as described by Soudry E, et al[11] 73 years as reported by Franco-Vidal, et al[9] 71years in a study by Sudhoff H, et al. [12] However, the age range of the patients as described by Sudhoff H, et al was similar to our study i.e. 40 – 80 years. However, the average age of the patients described by Stewart L, et al[13] was close to that of our results, i.e. 65 years.

A higher frequency of female patients (56%) was observed in our study. The same observation was seen in a study by Soudry E, et al, [14] the female population affected by the disease were 65%, and rest 35% were male. However, Aziz AA reported that all the patients presented and diagnosed with malignant otitis externa were male. However, it was a very small case series, which included only 6 patients. On the basis of above results, it can be observed that malignant otitis externa is more common in females as compared to males.

In our study, the CT scan findings revealed diagnosis of malignant otitis externa in 72% patients. The results of our study are quite comparable to the study by Sudhoff H, et al[12] who claimed those to be in 70% patients. However, the study by Glynn F, et al, and study by Aziz AA, et al showed the CT scan confirmed the diagnosis of malignant otitis externa in 100 % patients. However, these were case series and reported only few patients (9 patients by Aziz AA, and 6 patients by Glyn F)[15,16].

In this study the bony erosion was seen in all the CT scans (100%) of the patients, in whom the diagnosis was confirmed by CT scans. This finding was confirmed by other authors like Glynn F and Aziz AA [19] in their studies i.e. the frequency of bony erosion was 100%. However, Sudhoff H described that bony erosion was seen in 70% of the CT scans of the patients with malignant otitis externa. Soft tissue involvement was seen in 91% of patients in our study which can be justified by the fact that CT scan is not considered ideal for the soft tissue findings.

CONCLUSION

CT scan can be used for establishing radiological diagnosis of malignant otitis externa. It is also excellent in detection of bony erosion in patients with malignant otitis externa. However, multi-center trials for a longer period are required to better estimate the role of this technique.

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