ORIGINAL ARTICLE

Auricular Sinus

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Summary

A total of 56 subjects with auricular sinuses were investigated at the ENT clinic of Universiti Kebangsaan Malaysia (UKM) from April 1986 to April 1987. Infection was the main complaint, accounting for 60% of the cases. Chinese formed the majority of the patients (51%) and the commonest age group was between 1 to 10 years. Multiple anomalies were seen more amongst the Indians and none were noted among the Chinese subjects. Hearing loss was noted in 6% of the cases. Only infected cases were operated and none showed recurrence.

Key words: Auricular sinus, infection, hearing loss.

Introduction

Auricular sinus is a congenital malformation which may appear as an inconspicuous opening on the skin of the auricle or periauricular area. The sinus tract varies in length from 0.5 to 1.5 cm and is lined with keratinised stratified squamous epithelium. They are named according to the various positions they occupy (Fig 1).

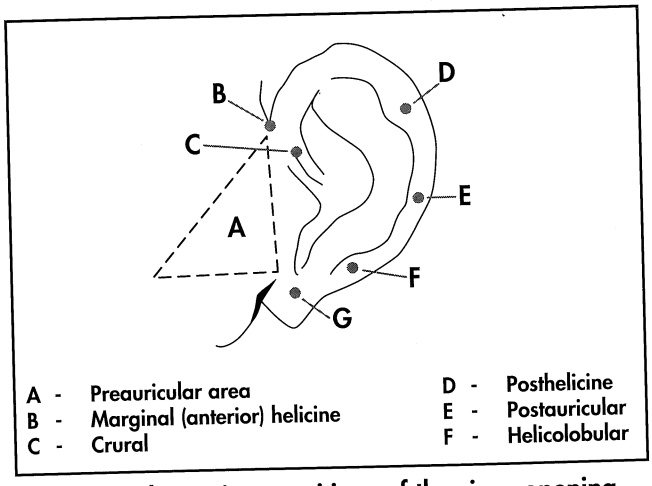

Fig 1: The various positions of the sinus opening.

Deafness has been reported to occur with auricular sinus. Renal anomalies are a well-known distal anomaly associated with this malformation. The main problem of auricular sinus is recurrent infection. The treatment is control of infection and later excision of the sinus tract. Since the anomaly can be transmitted as an autosomal dominant mode, there is a 50% risk of the anomaly being inherited.

This study aimed at documenting the local pattern of congenital auricular sinuses.

Materials and Methods

This study included all patients identified to have preauricular sinuses who attended the ENT clinic of UKM from April 1986 to April 1987. The affected family members and close relatives were also included and were examined in the clinic. A full history, including a detailed antenatal history, was taken. A pure tone audiometry was performed to detect hearing loss. A control group of equal number of age-matched patients was included in the study and their hearing levels were determined by pure tone audiometry.

Sinograms of the sinus tract were performed and infected cases were operated 4 to 6 weeks later when the infection had resolved. They were followed-up for a minimum period of 6 months.

Results

A total of 30 patients, which included 9 familial cases and 21 isolated cases, presented at the clinic. Twenty six affected relatives were also identified and were included in the study. The incidence of auricular sinuses seen in this institution is about 1:100 new cases per year. The majority of the patients were Chinese (54%) followed by the Malays (26%) and Indians (20%) (Table I). There were more females (68%) than males (Table I). The majority of them presented during the first decade of life (Fig 2) and infection, which ranged from 1 week to 10 years in duration, was the main complaint (Table II).

Table I
Racial and sex distribution of patients with auricular sinuses

	Male	Female	Total	
Chinese	6	10	16	(54%)
Malay	3	5	8	(26%)
Indian	2	4	6	(20%)
Total	11	19	30	(100%)

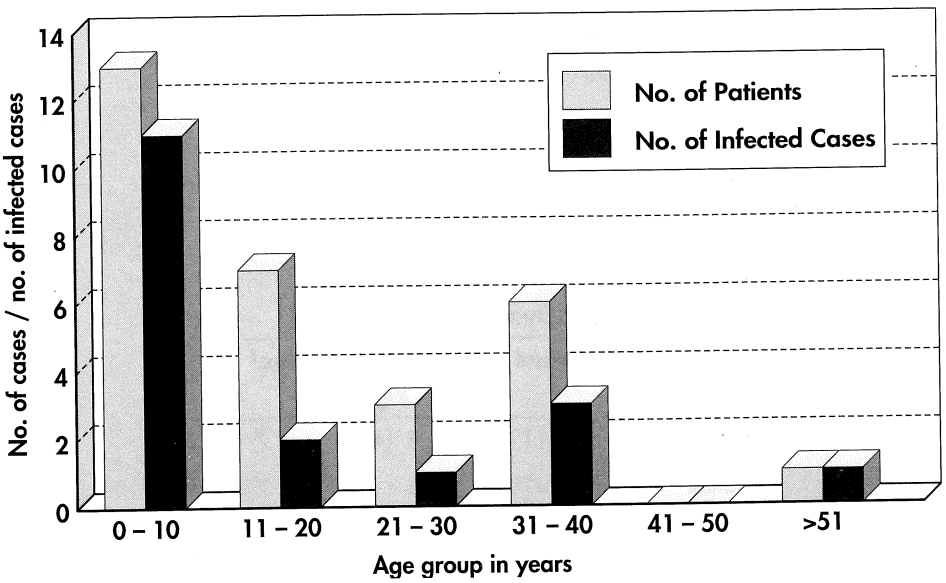

Fig 2: Bar chart showing distribution of patients with auricular sinuses/infected cases according to age group.

Table II
Reasons for consultation

Complaints	Frequency	(%)
Recurrent infection	18	(60%)
Cosmetic and curiousity	7	(23%)
Referred asymptomatic cases	2	(7%)
Discovered by chance	3	(10%)
Total	30	(100%)

Eighty one percent of the sinuses were anterior helicine and only 4.5% were preauricular in position (Table III). Bilateral sinuses were common in the isolated cases. The unilateral cases showed no predilection for either side (Table IV). Eight cases had additional anomalies, 5 aural anomalies, 1 microcephaly and 2 renal anomalies (Table V). Three patients in the study group had deafness compared with 4 cases of deafness identified in the control group.

Table III
Distribution of auricular sinuses by sites

Sites	Frequency	(%)
Anterior helicine	74	(81%)
Preauricular	4	(4.5%)
Crural	5	(5.5%)
Posthelicine	2	(2.2%)
Postauricular	2	(2.2%)
Helicolobular	0	
Intracanalicular	3	(3.3%)
Total no. of ears	90	(100%)

Table IV
Laterality of auricular sinuses

Types of cases	Bilateral	Unilateral	
		Right	Left
Isolated	6 (11%)	8 (14%)	7 (12.5%)
Familial	23 (41%)	5 (9%)	7 (12.5%)
Total	29 (52%)	13 (23%)	14 (25%)

Table V
Anomalies associated with auricular sinus

Anomalies	No of cases
Microtia	1
Bifid tragus	2
Malunion helix	1
Preauricular tag	1
Hydronephrotic kidney	1
Ectopic kidney	1
Microcephaly	1
Total no. of cases	8

In familial cases, heredity was responsible for the disease, while in isolated cases no definite predisposing aetiological factors could be identified. In most cases (14 out of 21), there were either no significant antenatal histories or the patients were unable to give satisfactory ones (Table VI).

Table VI
Antenatal histories of patients with non-familial auricular sinus

Antenatal history	No of cases
Antenatal pyrexia	2*
Drug exposure: vitamins	2
Irradiation	2**
Hydramnios	1
Negative history or poor antenatal recall	14

* ***Not associated with rash or pox formation occurring during the first trimester of pregnancy.***
** ***Plain abdominal X-Rays performed during the last trimester.***

An analysis of family pedigree (Fig 3) revealed the following:

1. There was a hereditary mode of transmission with dominant character of variable penetrance. Therefore, it could not be predicted by Mendelian law.

2. The auricular sinus occurred in both sexes and was therefore not sex-linked.

3. The bilaterality of the anomalies appeared to persist throughout the generations. The same pattern of inheritance was observed in unilateral cases. However, they did not share the same laterality.

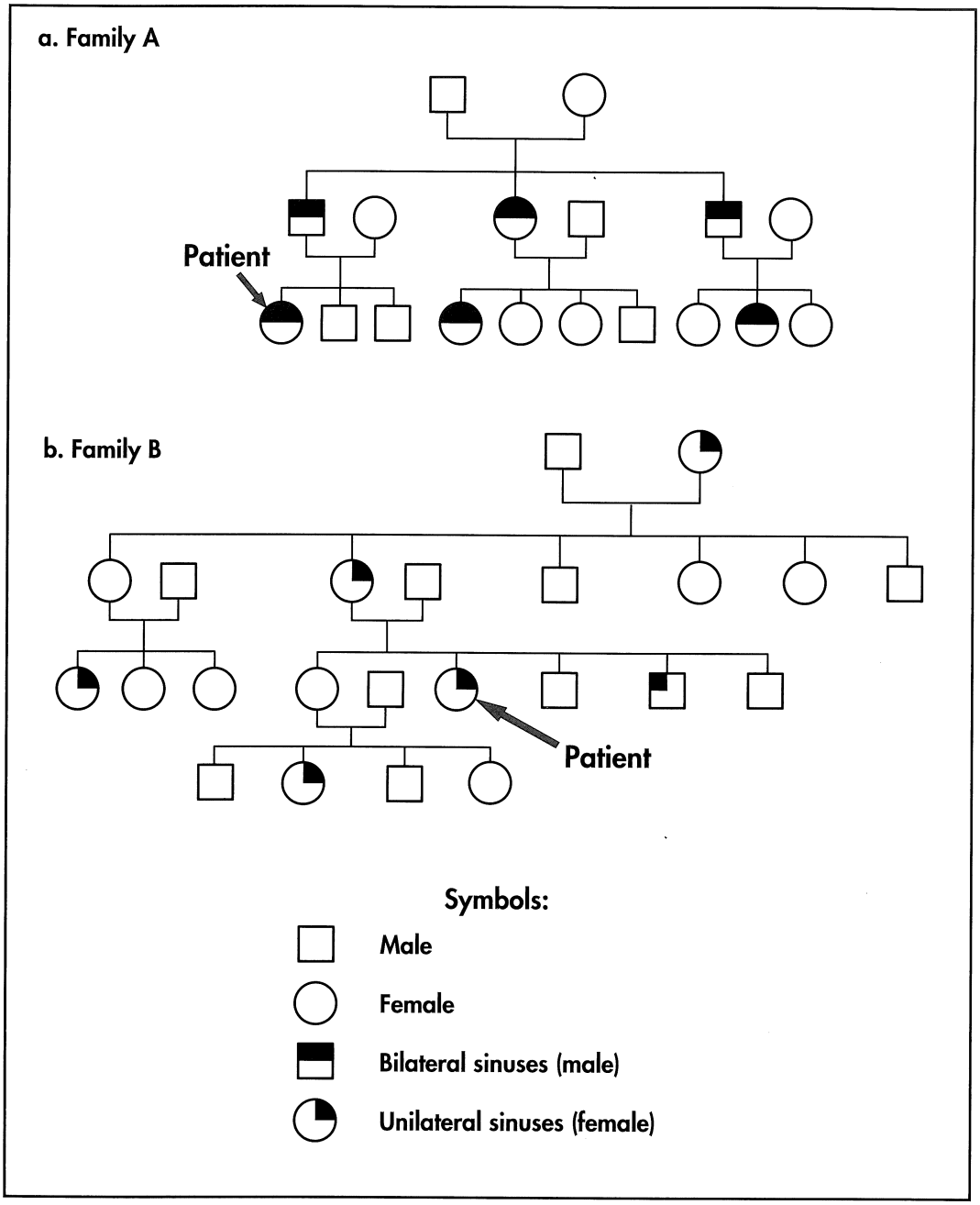

Fig 3: Two examples of recorded family pedigrees.

Sinograms of the sinus did not show the full extent of the tracts as observed during surgery.

Infected cases were operated by excision technique with primary skin closure. The sinus tracts lay in the subplatysmal plane immediately superficial to the perotid and temporalis fascia. The tracts were between 0.5 to 1.5 cm in length and lined by stratified squamous epithelium and contained keratin. No recurrence was observed during follow-up.

Discussion

Although this study covered a small number of subjects, it has shown that auricular sinus is not a rare anomaly encountered in the ENT clinic of UKM. A literature review seems to indicate that there is a discrepancy in the prevalence of auricular sinus among various races. A higher incidence has been reported among Negroes and Orientals[1]. In this study, the majority of the patients were Chinese (54%) although this may not be a true preponderance, because the Chinese formed 70% of the population of Kuala Lumpur.

Sexual predominance in incidence of many human disorders is well-known. This study has shown that the incidence of auricular sinuses is twice as common in females than in males. Similar observations have been reported by others[2,3].

The majority of cases presented in the first decade of life. Auricular sinus is prone to infection and it occurs at a young age. The secretions from the glands of the epithelial lining and the keratin debris which fail to self-cleanse cause obstruction of the tract, which later becomes infected. Healing causes fibrosis, which further obstructs the tract and causes recurrent infections.

In this study, 81% of the sinus openings were situated in the anterior helicine position, while only about 4.5% occupied the preauricular area. This is probably due to the fact that failure of fusion occurred with greatest frequency between tubercles 2 and 3, which was approximately where the anterior helicine sinus was located[1]. This is in contrast to findings by Sykes[4] in which 85% of the auricular sinus opened at the preauricular position.

It has already been established with sufficient certainty in the literature that auricular sinus is transmitted as a Mendelian dominant trait. The transmission is not sex-linked and genetic penetrance varies from 50% to 85%. Deletion of the short arm chromosome 4 and trisomy of chromosome 22 has been observed to occur in these patients[2,5]. However, in the isolated cases no probable underlying factors could be identified. Poor patients' antenatal histories were the main problem. A literature review showed that environmental influences on human ear development are poorly understood[6-8].

The overall incidence of accompanying anomalies in this study is about 14%. The associated otological anomalies were more frequent than non-otological anomalies. Perhaps the most interesting feature of the auricular sinus was the association of remote renal anomalies which was detected in 2 cases. The prevalence of renal involvement varies from 9% to 75%[9] and most authors attribute this to genetic aberration[10-12]. Deafness is a well-known defect associated with auricular sinus anomalies although this study failed to show such an association.

The findings of sinograms do not correlate well with the operative findings. The stenotic tracts prevent radio-opaque dye from delineating the whole length of the tract. For this reason, it is felt that sinograms are not a useful pre-operative investigation.

Infected sinuses were initially treated with antibiotics and later excised when the inflammation subsided. An elliptical incision was made around the sinus opening and the whole length of the tract was dissected out. In complicated cases with multiple openings, the incision had to be extended into superior and inferior limbs and the skin flap was raised to expose the tracts so that the various ramifications could be dissected out completely. The skin was usually closed primarily — however, in difficult cases where there was doubt regarding the completeness of the surgery, the skin defect was left open to granulate.

Auricular sinus is a fairly common ENT problem and the majority of cases occur in the younger age group, with recurrent infection. The aetiology of isolated cases is not completely understood, although in familial cases the genetic inheritance of the diseases has been established. Hearing impairment was not a predominant feature in this study. All infected sinuses should be excised and adequate skin exposure of the tract is the key to complete removal.

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