Indian J Otolaryngol Head Neck Surg
(July–Sept 2013) 65(3):234–236; DOI 10.1007/s12070-012-0520-y

ORIGINAL ARTICLE

Preauricular Sinus: A Novel Approach

Kavuturu V. S. Kumar Chowdary · Nelakurthi Sateesh Chandra · Ratnavelu Karthik Madesh

Received: 12 January 2012 / Accepted: 9 February 2012 / Published online: 25 February 2012

Abstract Preauricular sinus is a congenital malformation of the preauricular soft tissues with varied incidence and recurrence after excision. The aetiology of the condition, its clinical features, and associations with other congenital malformations is discussed. In the symptomatic preauricular sinus exhibiting recurrent or persistent infection, opinion regarding optimal management varies. Personal experience is presented as Wide local excision by Extended Post auricular incision via Supra Auricular approach giving good results without recurrence in a follow up of 8 years. The use of magnification during the procedure is a valuable tool.

Keywords Preauricular sinus · Excision · Recurrence

Introduction

Described first by Van Heusinger in 1864 [1], the preauricular sinus is a benign congenital malformation of the preauricular soft tissues. It is also termed as preauricular pit, preauricular fistula, preauricular tract and preauricular cyst. It has an estimated incidence of 0.1–0.9% in the general population. Mostly it is noted during routine ear, nose and throat examination, though can present as an infected and discharging sinus. Preauricular sinus is more often unilateral, only occasionally are bilateral forms inherited. The right side is more often involved and females more than males.

K. V. S. Kumar Chowdary (✉) · N. Sateesh Chandra
Department of ENT, H & NS, NRI ACADEMY of Medical Sciences, Chinnakakani, Mangalagiri, 522503 Guntur (Dist), Andhra Pradesh, India
e-mail: chowdaryent@yahoo.com

R. Karthik Madesh
Department of ENT, H & NS, INHS Sanjeevani Naval Base, Cochin, Kerala, India

Development and Genetics

The auricle develops during the sixth week of gestation from six mesenchymal proliferations, known as the hillocks of His; three from the caudal border of the first branchial arch and three from the cephalic border of the second branchial arch. These hillocks fuse to form the definitive auricle [2]. The most frequently cited and accepted theory attributes the development of a preauricular sinus to incomplete or defective fusion of the six auditory hillocks during the development of auricle. Branchial cleft anomalies can be intimately related to and involve the external auditory meatus, tympanic membrane or angle of the mandible, a preauricular sinus is not [3].

Occurrence is either sporadic or inherited. Over 50% of cases are unilateral, and most often sporadic. Bilateral cases are more likely to be inherited by incomplete autosomal dominance with reduced penetrance (nearly 85%). Researchers in China have mapped a possible locus for congenital preauricular fistula to chromosome 8q11.1–q13.3 by linkage analysis of a family comprising affected and non-affected members [4]. The preauricular sinus has been described as part of a number of syndromes and associations have been described with renal or inner ear anomalies.

Clinical Presentation

Preauricular sinus is an occasional finding and most frequently appears as a small pit close to the anterior margin of the ascending portion of the helix. The opening has also been reported along the postero superior margin of the helix, the tragus or the lobule [1]. Preauricular sinus may lead to the formation of a subcutaneous cyst that is intimately related to the tragal cartilage and the anterior crus of the helix.

The sinus course, in preauricular subcutaneous tissues, is not constant. The visible pit may represent the full extent of the deformity, or mark a sinus tract that can vary in length, branch and follow a tortuous course. Topographically, the sinus is located more superficially than the temporalis fascia, laterally and superiorly from the parotid gland and facial nerve in contrast to the tract of an anomaly of the first branchial cleft, which tends to be intimately related to these structures. In all cases, part of the tract blends with the perichondrium of the auricular cartilage [5]. Most sinuses are clinically silent, eventual, however not rare, appearance of symptoms is related to an infectious process. Erythema, swelling, pain and discharge are familiar signs and symptoms of infection. The most common pathogens causing infection are *Staphylococcal* species and, less frequently *Proteus*, *Streptococcus* and *Peptococcus* species [6].

Management

The majority of patients with preauricular sinus are asymptomatic. A sinus pit in a typical site is highly suggestive of the diagnosis. A thorough history and head and neck examination is mandatory in all cases, seeking evidence of associated anomalies. Where it is an isolated, asymptomatic finding no treatment is required. After patients with syndromic diagnoses are excluded from the analysis, Leung and Robson in Calgary, Canada, carried out a prospective study to investigate the incidence of renal anomalies associated specifically with preauricular sinuses and concluded such anomalies were significantly more common in patients with a preauricular sinus than the 1% incidence of renal anomalies reported in the general population and advised renal ultrasound in all cases of preauricular sinuses. Wang et al. in California, U.S.A, refined Leung's indications for renal ultrasound [7, 8]. They suggested that renal ultrasound should only be performed on patients with a preauricular sinus and one or more of the following:

1. Another malformation or dysmorphic feature.
2. A family history of deafness.
3. An auricular and/or renal malformation.
4. A maternal history of gestational diabetes.

Despite certain limitations, these guidelines, proposed for considering renal ultrasound, appear both reasonable and appropriate for application in clinical practice. And doing audiometry in patients with preauricular sinus to rule out sensorineural hearing loss was not justified as proposed by many studies.

Where it is an isolated, asymptomatic finding no treatment is required. It is treated when infected only. In the acute phase of infection of a preauricular sinus, intervention is by administration of appropriate antibiotics, where an abscess is present, we do incision and drainage. Recurrent or persistent preauricular sinus infection requires surgical excision of the sinus along with its tract during a period of quiescence. Various surgical techniques have been described but no one technique gave good results. Incomplete excision is the cause of recurrence; recurrence rates have been reported between nil [3] and 42% [9]. The standard technique was to excise an ellipse of skin surrounding the preauricular sinus opening and to dissect out the individual tract: the simple sinectomy. The technique of Wide local excision by Extended Post auricular incision in a Supra Auricular approach under general anaesthesia has been giving good results (ref).

Materials and Methods

Preauricular sinus has been operated in 34 patients with the technique of Wide local excision by Extended Post auricular incision in Supra Auricular approach in 34 cases over a period of 9 years with post op follow up of 1–8 years. Of these 11 cases were recurrent and 23 cases were operated primarily. The same procedure and protocols were followed in all cases. Except routine examination for general anaesthesia, no specific investigations were done. All the cases were operated under general anaesthesia. The incision is started as an ellipse around the sinus pit and extended superiorly and posteriorly into the post aural sulcus. After the incision, Dissection is carried out to identify the temporalis fascia forming the medial limit of the dissection, and continued over the cartilage of the anterior helix, regarded as the posterior margin of dissection. The use of self retaining mastoid retractor has been very much useful to retract the tissues. Tissue superficial to the temporalis fascia is removed together with the preauricular sinus. A portion of the cartilage or perichondrium of the helix at the base of the sinus excised ensuring complete removal of the epithelial lining in all cases [12]. Dead space obliterated by layered closure. Skin sutured with 3′O silk or prolene. Drain kept in when the incision is extended halfway through post aural region or else wound closed [3]. Mastoid dressing applied and removed after 24 h along with the drain. The patients are given a course of antibiotics and anti inflammatory drugs for 5 days. Suture removal done after 7 days. Cosmesis is very good. The use of magnification by loupe or operating microscope helps a lot in this approach.

Discussion

Various surgical techniques have been described for the management of preauricular sinus, but no one technique gave good results. Incomplete excision is the cause of recurrence of

a preauricular sinus; recurrence rates have been reported between nil [3] and 42% [9]. A more radical supra-auricular approach (Wide local excision) was made by Prasad et al. in 1990 [9] and by Lam et al. in 2001 [10]. Based on these reports, the supra-auricular approach has a lower recurrence rate 5% (of 21) vs. 42% (of 12) [9] and 3.7% (of 27) vs. 32% (of 25) [10]. And our series had zero recurrence rate in 34 cases with a follow up of 9 years. Magnification by loupe or operating microscope was used wherever required, towards helping in no recurrence. Many other techniques and modifications have been proposed but with variable acceptance. More recently, Baatenburg de Jong has described a modification of the Wide local excision technique [11] ''inside-out'' technique, first introduced by Jesma in Rotterdam, but at that time unpublished. The method involves mandatory use of magnifying glasses or a microscope. An elliptical incision is made in the skin around the sinus pit and the sinus is opened. The sinus is viewed and followed from both outside (as in the classic procedures) and inside. Each subsequent branching tract is opened and followed until every dead end is identified and excised. Baatenburg de Jong describes a recurrence rate of 0% in 23 patients in whom the inside-out technique was employed. This is not a widely employed method but certainly deserves interest, and further trial. But in our series though we used magnification we did not try to explore each and every branch of the sinus, but we had very good results. Currie et al. carried out a retrospective review over a period of 8 years in Hong Kong in 159 operations in 117 patients and proposed that factors like previous excision, the use of a probe to delineate the sinus, post-operative wound sepsis and operating under local anaesthetic all increased the chance of recurrence [3]. At the same time they also proposed that meticulous dissection of the sinus by an experienced Otorhinolaryngologist, operating under general anaesthesia, the use of the supra-auricular approach with clearance down to the temporalis fascia, avoidance of sinus rupture and closure of wound dead space reduce the chances of recurrence. Supportingly in our series also we did not have any recurrence and if the same technique is followed thoroughly other issues have not importance and there is no learning curve.

To aid complete resection and prevent recurrence of the sinus a, by whichever chosen surgical method, several adjunctive techniques have been suggested. Pre-operative sonograms, sinograms, intra-operative methylene blue injection and the use of a lacrimal probe have all been described, but of variable benefit. Lacrimal probe trauma to the tract may be disadvantageous in causing deeper scarring and subsequent difficulty in excision [12]. Each technical variant proposed has limitations: the lacrimal probe trauma may cause a false course and is unable to follow small ramifications; methylene blue has a vital diffusion in tissues thus making correct identification of the smallest ramifications difficult. Fistulography needs experienced hands, far from acute infectious episodes, and offers only approximate indications regarding the sinus length, and no suggestion concerning its depth. These issues are likely responsible for insufficient surgical radicality and consequently the high recurrence rate. Moreover, another aspect that appears to play an important role in the recurrence rate is the type of anaesthesia; in our experience, in agreement with Yeo et al. [13].Surgery performed under general anaesthesia did not have any recurrence. The reasons are probably related to patient's limited compliance with surgical manoeuvres and to confounding factors that infiltration itself represents. Individual preference currently dictates which of these methods is used, but Wide local excision by Extended Post auricular incision in a Supra Auricular approach under general anaesthesia will definitely give good results, and lot much variations described in the literature are not essential. This is a very simple technique which doesn't need any learning curve.

Acknowledgment There are no supports, grants or financial interests into the article by any of the authors.

References

1. Chami RG, Apesos J (1989) Treatment of asymptomatic preauricular sinuses: challenging conventional wisdom. Ann Plast Surg 23:406–411
2. Sadler TW (1990) Langman's Medical Embryology, 6th edn. Williams & Wilkins, Baltimore, pp 334–335
3. Currie AR, King WWK, Vlantis AC, Li AKC (1996) Pitfalls in the management of preauricular sinuses. Br J Surg 83:1722–1724
4. Zou F, Peng Y, Wang X, Sun A et al (2003) A locus for congenital preauricular fistula maps to chromosome 8q11.1–q13.3. J Hum Genet 48:155–158
5. Emery JP, Salama NY (1981) Congenital preauricular sinus. A study of 31 cases seen over a 10-year period. Int J Pediatr Otolaryngol 3:205–212
6. Scheinfeld NS, Silverberg NB, Weinberg JM, Nozad V (2004) Preauricular sinus: a review of its clinical presentation, treatment, and associations. Pediatr Dermatol 21:191–196
7. Leung AKC, Robson WLM (1992) Association of the preauricular sinuses and renal anomalies. Urology 40:259–261
8. Wang RY, Earl DL, Ruder RO, Graham JM (2001) Syndromic ear anomalies and renal ultrasound. Pediatrics 108:e32
9. Prasad S, Grundfast K, Milmore G (1990) Management of congenital preauricular pit and sinus tract in children. Laryngoscope 100:320–321
10. Lam HCK, Soo G, Wormald PJ, Van Hasselt CA (2001) Excision of the preauricular sinus: a comparison of two surgical techniques. Laryngoscope 111:317–319
11. Baatenburg de Jong R (2005) A new surgical technique for treatment of preauricular sinus. Surgery 137:567–570
12. Coatesworth P, Patmore H, Jose J (2003) Management of an infected preauricular sinus, using a lacrimal probe. J Laryngol Otol 117:983–984
13. Yeo S, Jun B, Park S, Lee J, Song C, Chang K et al (2006) The preauricular sinus: factors contributing to recurrence after surgery. Am J Otolaryngol 27:396–400