rare and we have been able to discover only one case (Bogdonoff *et al.*, 1956). It is therefore not surprising that evidence of histological calcification is also uncommon.

Summary

A patient with primary hyperparathyroidism and renal damage had the radiological picture of "rugger jersey" spine due to zones of osteosclerosis. This appearance does not, as has been stated, show that the hyperparathyroidism is secondary to renal damage, but merely that renal damage coexists.

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Medical Memoranda

Lateral Cervical and Preauricular Sinuses: Their Transmission as Dominant Characters

Lateral cervical sinus or fistula is not an unfamiliar condition to the paediatric surgeon. Gross (1953) reports 148 cases from the records of the Boston Children's Hospital, 25 of them bilateral. It is also known as "branchial sinus or fistula," a designation which appears in most of the standard surgical textbooks.

The name "fistula" is used here when referring to a "complete" lesion which communicates with both the skin and the pharynx, the name "sinus" when referring to an incomplete lesion that communicates only with one of them (nearly always the skin) (Aird, 1949).

Preauricular sinus is also not rare in a children's hospital. Gross (1943) reports 44 cases, of which 12 were bilateral.

EMBRYOLOGY

Lateral Cervical Sinus.—In the first two or three weeks of embryonic life, four (or possibly five) grooves develop in either side of the neck, running obliquely downward, forward, and somewhat medially, which are called the branchial clefts. They are matched internally by out-pocketings of the foregut which are the branchial pouches. They delimit in between them the branchial arches, which later will give rise to the neck and lower part of the face. By the fifth week an overgrowth of the second branchial arch will extend down in front of the arches caudal to it, forming the precervical sinus (the cephalic portion of which is the second branchial cleft). The lateral cervical fistula is derived from the second branchial pouch, and the precervical sinus. The lateral cervical sinus, opening in the skin, derives only from the latter. Confirmation of that origin is given by the usual findings at operation; (a) that the fistulous tract runs in between the internal and external carotid arteries, the former from the second branchial arch and the latter from the third; (b) that the pharyngeal opening, when it exists, lies in the tonsillar fossa, which corresponds to the internal end of the second pouch.

Preauricular Sinus.—The different parts of the ear arise from six small nodules, first described by His (1885), which develop around the dorsal extremity of the first branchial cleft. The three nodules from the first arch would give the tragus and helix, and the three nodules from the second arch the antitragus and antihelix.

Though no agreement exists about the origin of preauricular sinuses, according to Aird (1949) the least objectionable hypothesis regards them as the result of the inclusion of part of the angle between the base of the first tubercle and the adjacent skin. The direction and length of the sinus would be due to the growth of the mandibular process with downward and forward stretching of the overlying skin, while the bottom of each groove would remain fixed.

Photographs showing lateral cervical and preauricular sinuses.

CLINICAL AND PATHOLOGICAL DATA

Mucoid discharge is commonly a presenting symptom in lateral cervical sinus. A small orifice is usually present since birth along the lower third of the anterior border of the sternomastoid. Especially in the cases of recurrent infection, which are frequent, that orifice develops a crescentic upper border with scarring and puckering above it, and moves when swallowing. The sinuses are lined either with ciliated or non-ciliated columnar epithelium or by stratified squamous epithelium, with a wall rich in lymphoid tissue. Apart from the cases described by Kindar (1954) no others have apparently been reported as containing muscle in their wall.

The most common place for "ear pits" is in the preauricular position. They are narrow blind sinuses, usually only a few millimetres deep, rarely becoming infected. They are lined by squamous epithelium only.

TREATMENT OF LATERAL CERVICAL SINUSES

Routine excision always when no inflammatory signs are present. In preauricular sinus, if uncomplicated, routine excision is not necessary. In both conditions, if an abscess has formed it must be treated as such, and incision and drainage performed prior to removal of the lesion.

CASE REPORT

The patient was first seen at the Royal Liverpool Children's Hospital on May 23, 1958, when 5 years old. Since birth small sinuses had been present on both sides of the neck. The sinus on the left side had been discharging intermittently for the previous three years, and an underlying swelling had occasionally been noticed.

On examination he was found to have a typical right branchial sinus at the level of the cricoid. The left sinus opening was at the same level, but a very large abscess discharging pus was present underneath. It was noticed that the child also had bilateral preauricular sinuses (see photographs).

The left branchial sinus required incision and drainage twice, but it was impossible to eradicate the infection completely, and it was decided to excise the bilateral sinuses under antibiotic cover. This was done with oxytetracycline, to which the haemolytic streptococcus grown pre-operatively was found to be sensitive. The excision was performed on September 17, 1958, and he made an uneventful recovery.

both wounds healing well. The diagnosis of the branchial sinuses was confirmed histologically, but the left one was found to have a large cystic dilatation at its distal portion.

The mother, who accompanied the child to the clinic, was also found to have bilateral branchial and preauricular sinuses. She gave the information that the child's grandmother, who died relatively young, suffered from the same condition. None of the other members of the family on the maternal side (two uncles, and four cousins whose sex is unknown) had similar complaints (see Family Tree).

The patient's mother died recently at the age of 31. A diagnosis of chronic nephritis was made. Unfortunately, no I.V.P. was ever done and permission for a post-mortem examination was refused. Though the child did not have symptoms, the history and his rather peculiar facies (vaguely reminiscent of the facies in renal agenesis) prompted us to do an I.V.P., and this in fact confirmed our suspicions. It showed a very small hypoplastic right kidney and some dilatation of the pelvis of the left kidney, with caliceal abnormality, the superior calices seeming to be absent.

COMMENT

It is well known that preauricular sinus is inherited as an incomplete dominant of variable manifestation and without sex difference. Heusinger (1864) was the first to note the familial occurrence of the complaint. According to Aird (1949), the frequency of such a lesion in a small community including several affected families can be as high as 5%. Still quoting Aird, Sir Arthur Keith in 1909 illustrated the occurrence of preauricular sinus with other congenital abnormalities, such as cleft-palate, spina bifida, and imperforate anus.

In our patient definite congenital renal anomalies are present (and most probably were in his mother).

Last but not least, because it is in fact the main reason for this case report, there is the existence of bilateral lateral cervical sinuses in the child, his mother, and grandmother, strongly supporting the idea that they can be transmitted through a dominant Mendelian factor. So far as we have been able to investigate, only one case has yet been described in which a male patient, his father, and his grandfather all suffered from a right lateral cervical sinus (Kinder, 1954) though with no other associated anomalies.

Another point of interest is that, in our case as in that of Kinder, a cystic dilatation was present in the course of the fistula, which is most unusual and normally is considered to be the result of secondary dilatation of the tract after obstruction and infection. Because in our patient such a cyst arose only on the infected side, we think that Kinder's suggestion that in his patients the cyst formation was not due to chance complication but to a Mendelian dominant factor can be rejected.

Also of note is that the lateral cervical sinus appeared bilaterally in all of our three cases, and that in Kinder's three cases it was apparently on the same side (right). This has been observed to happen with preauricular sinuses, where in unilateral cases they tend to appear more on one particular side (right or left) (Edmonds and Keeler, 1940). So far it had not been recognized in the lateral cervical sinus.

I am indebted to Miss Isabella Forshall for allowing me to publish this case; to Dr. G. W. Roberts, Flintshire County Council Officer of Health, and Miss M. Williams, health visitor, for their invaluable help in obtaining a family history; and to Mr. Rodney Green for the photographs.

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