The nasal chondroma

2 case reports and a survey of the literature

By DAVID KILBY (Newcastle upon Tyne) and A. G. AMBEGAOKAR (Cardiff)

THE purpose of this paper is to describe two cases of nasal chondroma and attempt to give a comprehensive review of the past world literature. The first recorded case was probably that of Morgan reported in 1842.

Case Reports

1. *Case History*—A.E., a housewife aged 58 years, presented in the E.N.T. clinic on 13.11.48.

Complaints

(a) Nasal obstruction for many years but worse on the left side for the last six months.

(b) Sensation of fullness in nose for five months.

There was no history of previous nasal trauma, epistaxis or pain.

Examination. There was a diffuse firm swelling over the left nasal bone and ascending process of the maxilla. The orbital contents were not displaced and the hard palate was in no way deformed.

Anterior rhinoscopy—showed the left nasal passage to be totally blocked by a smooth pale rubbery swelling. The tumour had pushed the septum markedly to the right side.

It was not possible to visualize the nasopharynx.

X-rays of the sinuses and nose showed the nasal cavity to be opaque and the septum deviated to the right.

There was some opacity of the left antrum but no evidence of bony erosion.

Operations—Under general anaesthetic on 1.12.48 and 12.12.48. Biopsies were taken from the nose. Both histological studies revealed nasal chondroma.

On 11.1.49 under general anaesthetic with endotracheal intubation the patient underwent a left lateral rhinotomy. The left nasal bone was found to be very thin. The tumour completely occupied the left nasal cavity and had the consistency of a 'ripe pear'. After removing the tumour piecemeal it was thought that the site of origin was the posterior edge of the nasal septum. The area of tumour origin was 4 cm. in diameter and it was possible to preserve the septal mucosa on the opposite side. The left maxillary antrum was intact and an intranasal antrostomy was fashioned.

A BIPP pack was inserted into the cavity and the skin closed in layers. One unit of blood was administered throughout the operation.

Post-operative recovery was uneventful. Regular checks were made in the clinic. Two further lateral rhinotomy procedures were deemed necessary and

https://doi.org/10.1017/S0022215100083882 Published online by Cambridge University Press

performed on 3.7.51 and 11.6.55 for tumour recurrence in the nose. The patient was found eventually to have an increased external deformity on 18.3.58.

Anterior rhinoscopy revealed virtually total nasal obstruction on the left side resulting from residual growth. The anterior end of the hard palate was irregularly swollen but not ulcerated.

Operation—5.4.58. Exploration was performed under endotracheal anaesthesia through a left-sided Ferguson incision. There was tumour invasion of the left antrum, anterior alveolus and cribriform plate. Piecemeal tumour excision resulted in a moderate CSF leak. The frontal sinus looked healthy but was exenterated.

A Whitehead's varnish pack was placed in the resulting cavity and the patient received three units of whole blood. The skin was closed in layers.

Death followed within 24 hours from a myocardial infarction.

Histology—Two independent histologists reported the tumour as a chondroma exhibiting some myxomatous degeneration (Fig. 1).

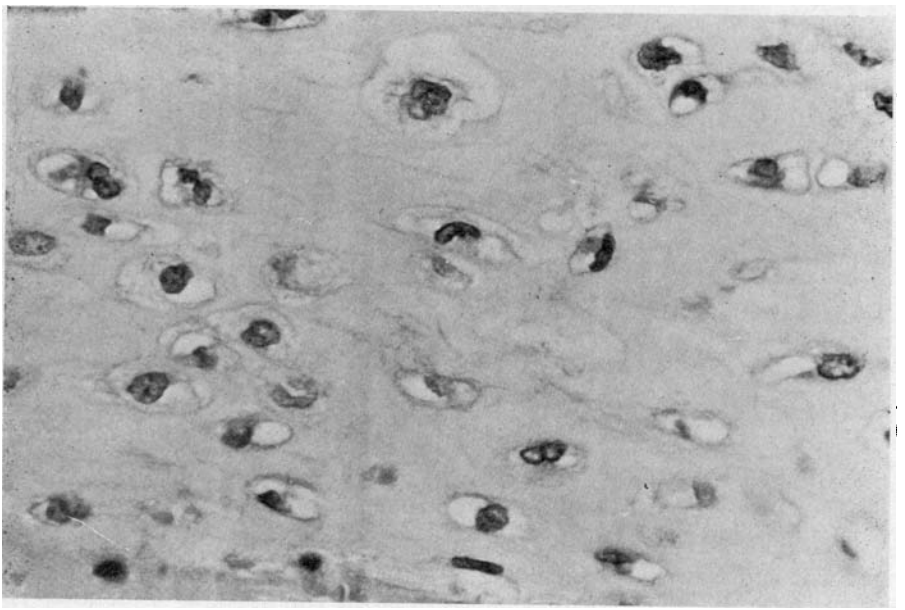


FIG. 1.
Specimen from Case 1.

2. *Case History*—S.J., a female aged 10 years, presented in the E.N.T. clinic on 2.5.68.

Complaints

(a) 'Thick speech' and frequent colds for twelve months.

(b) 'Broadening of the nose' and mild nose bleeds for 6 months.

(At the age of 18 months she had received a significant blow to the face).

Examination. On external examination, the nose was found to be broadened. Anterior rhinoscopy—a prominent septal deviation to the right side was

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evident and there was a firm swelling in the region of the right middle turbinate which bled readily after probing it.

The nasopharynx was not visualized.

X-rays—A plain sinus film showed the right antrum to be opaque and the opacity extended into the adjacent ethmoids and right nasal cavity. There was a suggestion of erosion of the right antronasal wall. Films of the nasopharynx showed minimal soft tissue swelling in the adenoid area.

Operation—On 3.6.68 under general anaesthesia with the nasal mucosa cocainized an SMR was undertaken for access to the right lateral nasal wall. The right middle turbinate was found to be enlarged and firm. A biopsy was taken from this area.

Histology Report—pure chondroma.

Operation—on 21.8.68 employing endotracheal anaesthesia. A tumour the consistency of a 'ripe pear' was encountered in the ipsilateral ethmoids and middle turbinate areas. The lesion was the size of a small mandarin orange and it was removed piecemeal. The right antral cavity was very small because of extrinsic pressure from the neoplasm. A right-sided intranasal antrostomy was fashioned and the resulting cavity packed with BIPP ribbon gauze. The skin around was closed in layers. One unit of blood was administered during the operation.

Histology Report—numerous fragments total weight—40 gm.

'There are some immature cartilage cells in small areas separated by loose connective tissue. In some areas cartilage is undergoing calcification. There is no evidence of malignancy' (Fig. 2).

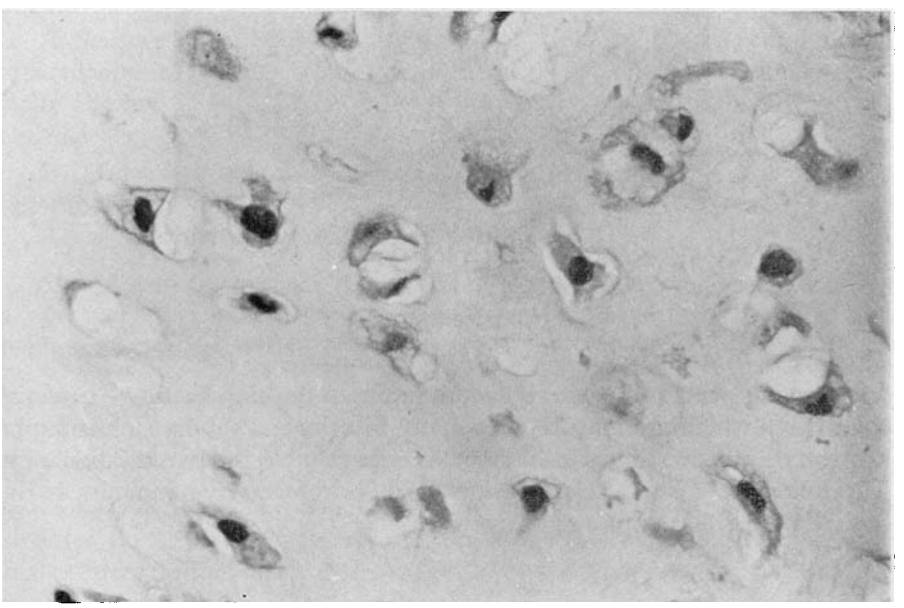


FIG. 2.
Specimen from Case 2.

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Post-operatively the BIPP pack was gradually removed over the next ten days and the skin sutures dispensed with on the eighth post-operative day.

Facial appearance on 16.10.68 was as in Fig. 3 the scar showing marked keloid formation.



FIG. 3.
Keloid scar Case 2.

Discussion

Pathology of Cartilage Tumours in General

Growing parts are naturally more liable to develop cartilage tumours than those which are mature. The many histological subdivisions may be arbitrary and the clinical behaviour a more reliable index of malignancy. The following general classification of chondroformative tumours is the one recommended by Winston Evans (1968).

1. Enchondroma ←
   - A Solitary
   - B Multiple

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2. Osteochondroma ← { A Solitary / B Multiple }

3. Benign Chondroblastoma (epiphyseal giant cell tumour of Codman)

4. Chondromyxoid Fibroma (chondromatous osteoclastoma)

5. Chondrosarcoma.

1. *Enchondroma*

A. *Solitary Lesions* are seen especially in metaphyseal areas of phalanges and metacarpals of the hands. Less frequently they occur in the foot and lower limb bones. Only rarely are they a feature in the skull. The peak age incidence according to Geschickter and Copeland is 20 to 30 years. There is no sex preference. Macroscopically the tumours are lobulated masses in cystic or solid nodules. The cystic appearances may be consequent to myxomatous degeneration.

Histologically the cartilage cells may be scattered in a fibrillar, elastic, vacuolated or mucinous matrix. The tumour capsule is often poorly developed and growth may in parts result from satellite lesions. Malignant changes do occasionally follow, especially in the lower limb group.

B. *Multiple Enchondromatosis* is a generalized disease and possibly hamartomatous.

2. *Osteochondroma*

A. *Solitary or osteocartilaginous exostosis*. This is not a true tumour but a cartilaginous anomaly. The lesion is evident in epiphyseal areas, especially the lower end of the femur and upper tibia. Chondrosarcomatous changes occasionally ensue.

B. *Multiple osteochondromatosis or diaphyseal aclasis* is a genetically determined disorder occurring especially in children.

Again sarcomatous transition may follow.

3. *Benign chondroblastoma* occurs most frequently in males aged 10 to 25 years. The commonest sites are lower femur and upper tibia and malignant transformation is very rare (Hatcher and Campbell, 1951).

4. *Chondromyxoid fibroma*—again is most apparent in the lower femur and upper tibia.

It is a rare neoplasm and up until 1960 only 37 cases were recorded

5. *Chondrosarcoma*. The femur, ribs and pelvic girdle are the commonest sites for this growth. It is more frequent in the older age group and the male-to-female incidence is 2:1. Generally the neoplasm is sarcoma 'de nouveau' but chondromata occasionally undergo sarcomatous transformation.

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The histology of chondrosarcoma may cause such difficulty and the clinical course may be the only criterion of its malignancy. The cytological criteria of malignancy put forward by Liechtenstein and Jaffé are:

1. Increased cellular density and general increase in size of cell nuclei
2. Cells with multiple nuclei
3. Irregularity in nuclear size
4. Nuclear hyperchromatism

Clinically the progress is slower than osteogeneic sarcoma and metastages are blood-borne.

Chondromas of the Nasal Cavities

Suggested classification

A. Ecchondromas—similar in nature to exostosis in bone

B. Enchondromas—a pure cartilaginous tumour

C. Enchondromas—(impure)—in which an excess of other tissues may designate them—fibrochondromas, myxochondromas, chondromatous myxomas, angiochondromas and osteochondromas

D. Sarcoma

Aetiology

There are four main theories of causation—namely:

1. Heredity
2. Cellular metaplasia
3. Trauma
4. Cell rest theory

Devalz reported three examples of nasal chondroma of the nasal septum in the same family. These tumours were thought to originate at the junction of bony and cartilaginous septum and may well have been large septal spurs.

The present authors have been unable to find any convincing evidence of heredity aetiology after reading the world literature.

Several authors (quoted by Schwerdfeger) including Lubarsch and Helmholtz cited metaplasia. There is in fact very little evidence for this as a cause.

Trauma has naturally been blamed.

The second case in the present report had at the age of 18 months sustained a blow to the face. Klaue (1924) and the present authors doubt if trauma plays any role. Injuries to the nose are a very common occurrence. Secondly chondroma invariably occur deep in the nasal cavity where accidental trauma is rare.

The most attractive theory of causation is that of cell rests. Numerous workers including Virchov (1897), Ringertz (1938), and Williams (1951)

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support this view. Ringertz (1938) believed that embryonal cartilage cell rests may escape resorption during enchondro-ossification and that enchondromata arise from these.

Schwerdfeger quotes Leopold who found in experiments that foetal cartilage when transplanted into other animals may grow up to 300 times its original size.

Sex Incidence

Menne and Frank (1937) in reviewing 14 cases found eight females and six males On reviewing the literature we found an equal sex distribution in 128 recorded cases of chondromas of the sinuses and nasal cavities.

Age of tumour presentation

In view of the fact that these lesions may present with nasal symptoms which can be tolerated for many years, it is easier to discuss the time of presentation rather than the time of onset. Chondromata of the nose have been recorded as early as eight months (McAuliffe, 1938) and as late as the seventh decade (Gordon, 1951). Figure 4 shows the age of distribution in the 128 cases we have been able to find in the literature.

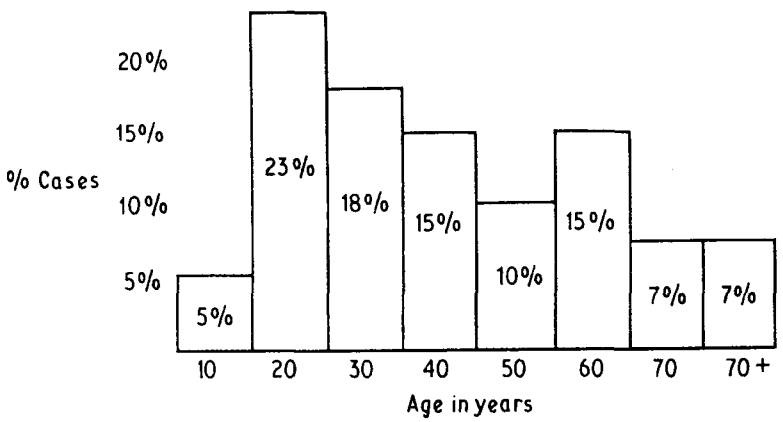


FIG. 4.
Figure showing age of presentation of patients.

Point of tumour origin

Many authors including Menne and Frank (1937) state that the site of tumour origin is difficult to state with certainty. Many of the so-called maxillary tumours have in the past been removed by 'general surgeons' who did not realize that they were in fact ethmoidal in origin. Ringertz (1938) estimated that 50 per cent of these tumours arose from the ethmoids. Williams (1951) found that out of 62 tumour cases 25 were of ethmoidal

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origin. The present authors on reviewing the world literature have divided tumour origin under six anatomical headings (Table I).

TABLE I.

TABLE SHOWING THE SITE OF ORIGIN OF NASAL CHONDROMAS IN 128 CASES

		Percentage
1.	Ethmoids and nasal cavity (excluding septum)	50
2.	Septum	17
3.	Maxilla and maxillary antrum	18
4.	Hard palate	6
5.	Nasopharynx sphenoid sinus or eustachian tube	6
6.	Alar cartilages	3

Incidence of Nasal Chondroma

Weber (1956) in 190 cases of chondroma found 8 examples in the upper jaw and Heyfelder (1857) in 456 cases of upper jaw disease found only 7 chondromas. Ringertz (1938) described only two examples in a series of 391 tumours of the nose and sinuses. It is therefore apparent that nasal chondroma is not a common disorder. Probably, the first serious review of the disease was in 1897 by Sicard. Reports of early workers have been difficult to assess because of the paucity of histological details and many of the so-called septal tumours were in reality septal spurs.

Pathology, Histology and Clinical Behaviour

Characteristically the lesions are smooth, firm and lobulated, but the consistency may be likened to a 'ripe pear'.

In general they are slow growing.

Care must be exercised in differentiating histologically between enchondromata and the rare chordoma.

The present authors found evidence of histological proof in only 109 out of 128 recorded cases. The incidence of the various histological types of tumours reviewed in the literature are given in Table II.

TABLE II.

		Percentage
1.	Chondroma	70
2.	Myxochondroma	10
3.	Fibrochondroma (including one fibromyxochondroma)	5
4.	Osteochondroma	15

Five cases were probably sarcomas from the start (Cendelin, 1969; Owen, 1946; Frolov, 1970; Dufour and Felletti, 1966; Leroux-Robert *et al.*, 1961). During the early stages before nasal obstruction occurs, neuralgia due to irritation of the sphenopalatine ganglion may occur. In the manifest

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stage, symptoms are those of nasal obstruction or pressure effects and deformities. Swellings of the cheek or palate may therefore occur. Interference with the orbital contents may cause proptosis or even blindness. We found a definite report of the latter in only five cases. Tendencies for these tumours to recur or perhaps for the surgeon to leave 'residual' disease is not uncommon. Some workers likened the behaviour of these tumours to bladder papillomata. The size and the fact that these tumours are often adjacent to vital structures, are important factors regarding residual disease. Patients are often willing to put up with symptoms for many years and an appreciable number in the past literature have first reported when the disease is beyond cure (Amitin and Moskovskaya, 1969; Dufour and Felletti, 1966; Gordon, 1955). Death from the tumour results from intracranial spread or pulmonary complications. Late sarcomatous change does occasionally occur (Lawson, 1956; Leroux-Robert, 1961; Kamiot, 1969).

Treatment

Treatment employed is surgery or external radiation.

Surgery may be divided into:

(a) Local excision
(b) Intranasal ethmoidectomy
(c) Wide excision (usually lateral rhinotomy or maxillectomy)

Local excision is justified for very small tumours, e.g. nasal septum (Stride, 1957). However, tumours in these sites can be huge (up to 80 gm. (Kamio, 1961). This technique has also been used with success for the small lesions of the palate (Blum, 1954) and eustachian tube orifice (Rao, 1956; Kishore, 1967).

Intranasal ethmoidectomy has been tried in many cases for ethmoidal lesions, but in general has not been sufficiently radical (Escat, 1901; Hickey, 1940; Assis, and Matheus, 1952). External excision of such tumours is essential (Gordon, 1951, 1955; Williams, 1951; Tsailigopoulos, 1962). It is generally agreed that irradiation is of little value. At least nine surgeons have utilized it in past years (Lawson, 1956; Schlittler, 1921; Klaue, 1924; Eggston and Wolff, 1947; Amitin and Moskovskaya, 1969; Galanti, 1953; Ducrocq, 1951; Ohngren, 1933; Stirk Adams, 1946). This treatment has been employed usually when the patient's disease is beyond surgical cure. It is interesting that the tumour reported by Lawson (1956) initially treated with radiotherapy underwent sarcomatous change seven years later.

Diagnosis and Investigations

The symptoms and signs are essentially those of slowly growing tumours. Plain X-ray slides plus tomographs help in assessing the extent

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of the tumour. In general nasal chondromas are not radio-opaque. However, radio-opacity has been recorded in several instances (Regules and Caubarrere, 1948; Assis and Matheus, 1952; Faccini and Williams, 1973). Biopsy is obviously the only certain means of diagnosis.

Summary

Two cases of nasal chondroma are recorded and the past literature reviewed. The importance is stressed of wide surgical excision for these lesions.

Acknowledgements

We wish to thank Mr. J. L. D. Williams who kindly allowed the inclusion of his case and encouragement in preparing this paper. Also Dr. S. Fujita of Henry Ford Hospital, Detroit, Michigan, U.S.A., for his help in translation.

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E.N.T. Department,
The Royal Victoria Hospital,
Newcastle Upon Tyne,
NE1 4LP.

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