# NASAL GLIOMA

By JAMES LISTER (London)*

THE appearance of ectopic glial tissue in the nasal region is rare; many names have been given to the condition, the commonest being "nasal glioma". The first detailed description of such a lesion was by Schmidt in 1900. Black and Smith reviewing the literature in 1950 found 33 cases and added one of their own. They classified the lesions into intranasal, extranasal and combined types though it may be difficult to trace an extension of the tumour either into or out of the nasal cavity. Miller and Neidhardt (1950) report an extranasal glioma. Cuthbert (1950) reports two intranasal gliomata and a third one which had previously had a tumour removed from the bridge of the nose which had not been examined histologically. Banham and Sharp (1951) and Kristensen (1953) report single cases of intranasal glioma. Macomber and Wang (1953) group congenital neoplasm of the nose into ectodermic tumours, mesodermic tumours and neurogenic tumours, and amongst the last include two cases of nasal glioma. Cassidy and Wahl (1954) discuss the ætiology of the appearance of central nervous system tissue in the nasal fossae, and report two cases of intranasal glioma. Dawson and Muir (1955) report two cases of extranasal glioma both with extensions through the nasal bone but no extension into the cranium. Low, Scheinberg and Andersen (1956) report two extranasal gliomata, one of which extended under the nasal bone towards the cribriform plate and was shown to have cerebral hypoplasia. Crosby (1957) reported a combined intra- and extranasal tumour. Morley and Cross (1958) reviewed the literature and added a case of their own presenting as an external tumour but with a pedicle passing under the nasal bone. Voorhoeve, Bakker and Sedee (1959) report an extranasal tumour. Davis and Alexander (1959) reporting various tumours in the nasofrontal region include one intranasal glioma. Hage (1960) in discussing an ingenious approach to the external and internal nose avoiding a scar on the bridge of the nose, reports one extranasal and one combined intra- and extranasal glioma. Borsanyi (1960) reports a case presenting as a bony tumour on the bridge of the nose in a 16 year old boy; this was found to be a nasal glioma communicating with the frontal sinus and enclosed in a bony capsule. Musser and Campbell (1961) report an extranasal glioma which had also several glial nodules in the scalp.

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https://doi.org/10.1017/S0022215100060333 Published online by Cambridge University Press

Fifty-seven cases have thus been found in the literature, of which 18 were intranasal, 33 extranasal and six mixed.

During the past fifteen years eleven cases have been seen at the Hospital for Sick Children, Great Ormond Street, and the Queen Elizabeth Hospital for Children. Of these, two were of the nasopharyngeal type

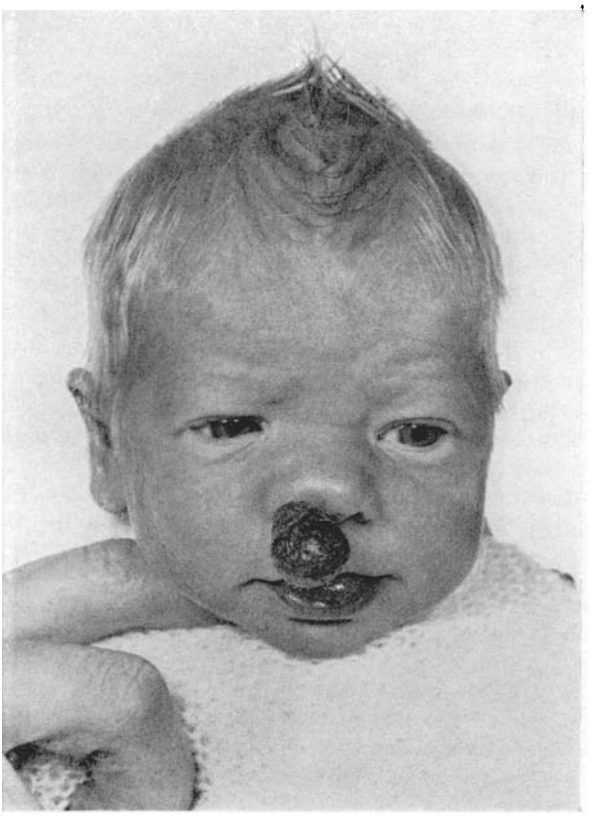


FIG. 1.
Case I. Intranasal glioma.

which are a little different and one was an intranasal glioma already reported by Banham and Sharp (1951). Of the remaining eight cases, two were intranasal and six extranasal.

CASE I. L.R. (Fig. 1)

A girl, aged 5 days, was seen with a mucosal polypoid tumour (2·5 × 1·5 cm.) protruding from the right nostril. The eyes were rather widely set. There was no interference with breathing. X-rays showed no bony defect.



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*Operation* 23.8.60 by Mr. James Crooks. After needle aspiration of the tumour revealed no fluid the lesion was transfixed and ligated just above the level of the nostril and excised.

*Histology* showed the "polyp" to consist of strands of well differentiated glial tissue.

In view of this a more radical excision was carried out two days later. The tumour was growing downwards between the nasal septum and the superior turbinate. In spite of the fact that the line of excision was not clear of glioma there has been no recurrence.

CASE II. L.B.

A girl aged 2½ was first seen by Mr. E. H. Sewell in Lymington Hospital, Hampshire, at the age of 5 days when she had left-sided nasal obstruction. At five weeks a mass the size of a large pea was removed, arising from a level above the left inferior turbinate. Histologically this tumour was found to be a hamartomatous mass of glial tissue. By the age of 2½ years there was a local recurrence of the tumour and she was referred to Great Ormond Street. X-rays showed no bony defect.

*Operation* 21.3.61. Mr. H. S. Sharp removed a tumour from the left side of the nose which arose high up anteriorly probably from the olfactory cleft. There was no evidence of intracranial extension.

*Histology:* Microscopy showed the typical feature of a nasal glioma without any anaplastic change.

No follow up after 3 months when she was well.

CASE III. R.W.

A girl, aged 4 weeks, was admitted to Great Ormond Street with a swelling over the bridge of the nose, 2 cms. in diameter, with some displacement of the nasal bones to the right. A tentative diagnosis of hæmangioma was made.

*Operation* 14.7.47. Sir Denis Browne excised the mass. Histology showed intermingled fingerlike processes of connective tissue and mature glial tissue extending into the dermis and to the cut edge of the specimen.

There has been no report of recurrence.

CASE IV. T.P.

A boy, aged 18 days, was admitted to Great Ormond Street. A soft pedunculated tumour arising from the left side of the bridge of the nose was noted at birth. The tumour was 1·5 cm. in diameter on a broad base; it was not reducible and there was no impulse on crying.

*Operation* 20.5.55. The tumour was excised under local anæsthesia by Sir Denis Browne; there was no deep connection though fibrous strands extended from the medial side of the base.

*Histology* showed the mass to consist of mature glial tissue, well vascularized and traversed by collagenous trabeculae. There was no evidence of malignant change.

There has been no report of recurrence.



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CASE V. V.B.

A boy, aged 4 weeks, was seen in the outpatient department at Great Ormond Street with a swelling on the right side of the bridge of the nose which had been noticed at birth. The swelling appeared to grow with the child. The outpatient diagnosis was "possibly a dermoid cyst".

*Operation* 16.10.57. The tumour was excised through a vertical incision by Mr. H. H. Nixon. It was found to be a small hard tumour, with no definite capsule, displacing the nasal cartilage to the left.

*Histology*. The tumour consisted of strands and whorls of fibrous tissue surrounding and intermingling with glial tissue. Most of the astrocytic glial tissue lay in the centre and towards one end but it extended amongst the fibrous tissue by finger-like process to the cut edges of the section.

At follow-up a lump was noted under the scar which appeared to grow very slightly with the child.

*Operation* 2.2.59. Through the previous incision Mr. Nixon explored the lesion again: the tumour was found to be attached to skin and to nasal cartilage and was excised together with a small piece of cartilage. Histology showed a similar section to the first one with no evidence of malignancy.

There has been no sign of further recurrence of this tumour.

CASE VI. G.S.

A girl, aged 1 year, who was born with a lump on her nose was seen in the out-patients department at Great Ormond Street. There was a midline swelling over the bridge of the nose about 1·5 cm. in diameter. There was some broadening of the bridge of the nose. The outpatient diagnosis was dermoid cyst.

*Operation* 11.3.58. Mr. I. Broomhead excised the swelling with some difficulty, through a transverse incision; there was no definite plane of cleavage and the tumour was firmly adherent to the nasal cartilage especially on the right.

*Histology* showed the lesion to consist of islands of finger like processes of glial tissue intermingling with fibrous tissue.

There has been no recurrence.

CASE VII. D.S. (Fig. 2)

A girl was born with a swelling on the right side of the bridge of the nose. This was diagnosed as "possibly a hæmangioma". She was admitted to the Queen Elizabeth Hospital at the age of 3 months.

*Operation* 28.8.59. Mr. V. A. J. Swain excised part of the tumour for biopsy and it was shown to be a nasal glioma. A year later (23.8.60) a further portion of the tumour was removed ; it was adherent to nasal cartilage. There was no evidence of deep connection. In September 1961, there was still a small protuberance at the site of the operation but it was not increasing in size. Further excision of the mass is proposed.

CASE VIII. A.S. (Fig. 3)

A boy, aged 10 days, presented with a swelling over the left side of the bridge of the nose. The bridge of the nose was wide and the left lacrimal duct



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was blocked. He was admitted to the Queen Elizabeth Hospital, Shadwell, under the care of Dr. I. M. Anderson. X-rays showed no bony defect and the pre-operative diagnosis was dermoid.

*Operation* 15.5.60. The swelling was explored through an oblique incision; it was found to be adherent to skin and to the underlying nasal bone on the

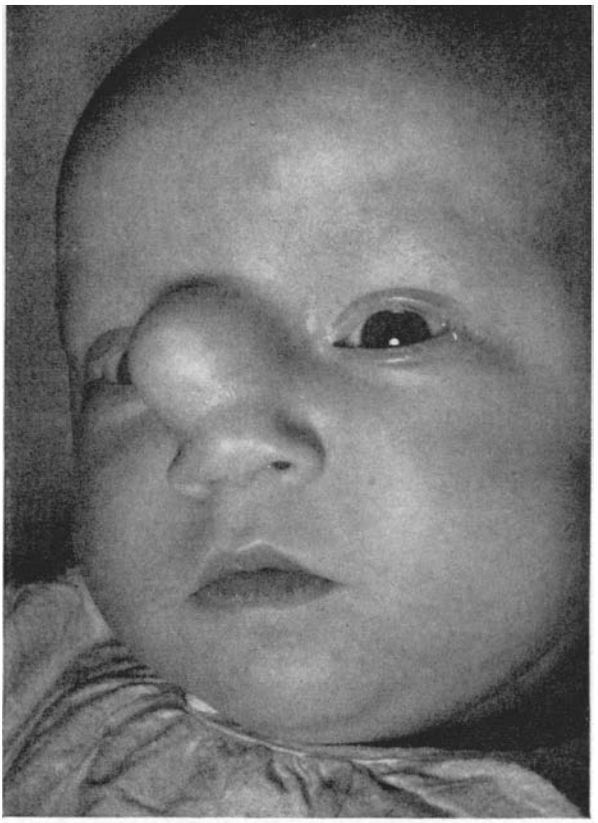


FIG. 2.
Case VII. Extranasal glioma.

left side ; the bulk of the tumour was removed piecemeal. Histology showed a typical glioma.

The patient was lost to follow up until he was 1 year old, when he was found to have a degree of hydrocephalus. At 15 months he was admitted to hospital with evidence of increased intracranial pressure. The day after admission he collapsed with brain stem compression; breathing was restored after ventricular decompression and positive pressure respiration through an endotracheal tube. He remained unconscious for 10 weeks during which time ventriculography and carotid arteriograms were carried out; these showed



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hydrocephalus and porencephaly but no evidence of neoplasm was found. Because of the extensive brain damage craniotomy was not considered justifiable.

The present position is that there has been no recurrence of the original growth. The level of consciousness has increased and the child responds to some stimuli, but the nature of his intracranial pathology remains in doubt.

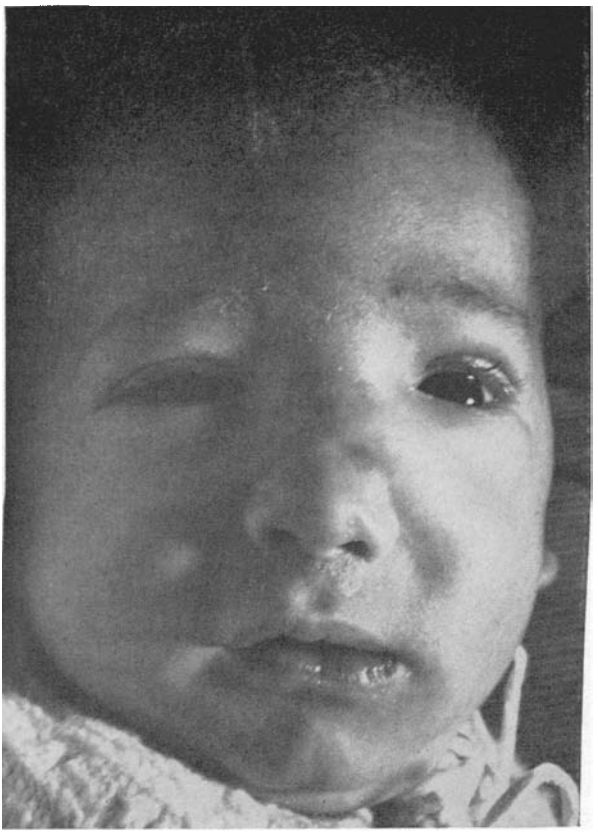


FIG. 3.
Case VIII. Extranasal glioma showing marked widening of bridge of nose.

## Pathology

The histological appearances (Fig. 4) in all these cases showed the typical fibrillary neuroglia intersected with bands of fibrous tissue and resembling a glioma. Most sections showed considerable vascularity and many showed a few neurones. Although there was never any true capsule shown, and the tumour tended to infiltrate into the surrounding tissues, there was no evidence of true malignant growth. The recurrences were in all cases due to incomplete excision.



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The most attractive explanation of these tumours is Schmidt's theory (Schmidt, 1900) that they are related to encephaloceles. Willis (1958) states that an encephalocele is not a herniation of parts which were originally intracranial but a primary anomaly of growth and separation of the neural tube from the overlying ectoderm. If the neural tube remains connected to the skin, then mesoderm cannot grow between and there

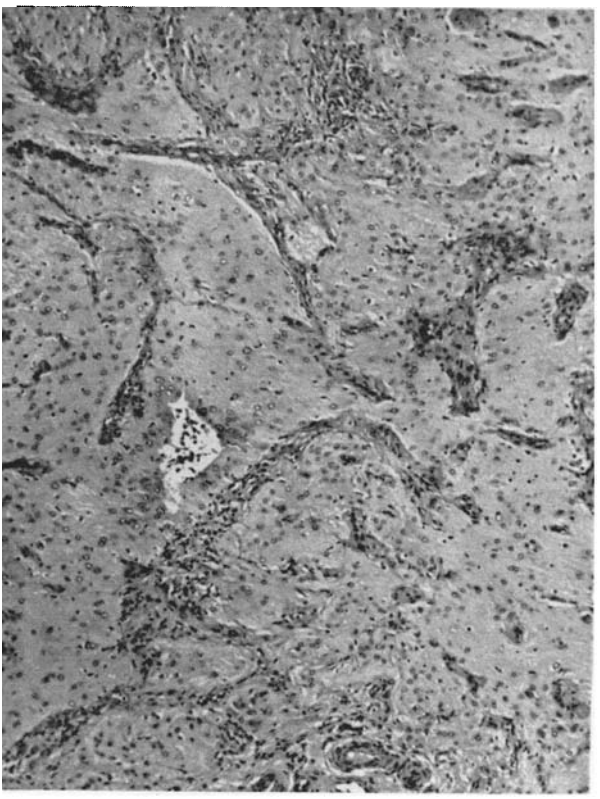


FIG. 4.

Histological appearance of extranasal glioma showing fibrillary neuroglia intersected with bands of connective tissue and resembling a glioma.

will be a gap in the skull; if the separation of the neural tube were delayed and normal growth later resumed, then glial tissue could be isolated, either partially or completely. This theory is supported by the occurrence of nasal gliomata with a stalklike intracranial connection.

## Diagnosis

Owing to the rarity of the lesion diagnosis was rarely made on first examination. Certain pointers are of help, however; the presence of the



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lesion from birth, the widening of the bridge of the nose, and the fact that the tumours cannot be compressed and do not show any impulse on crying.

The intranasal type may be diagnosed as a simple nasal polyp, but more dangerous is the possibility of the lesion being an encephalocele. Impulse on crying and radiological evidence of a bony gap may be difficult to obtain. Aspiration of the tumour is a risky performance because of the danger of meningitis, though Moore (1952) has pointed out that if fluid obtained by aspiration is cerebrospinal fluid the protein content will be 15–45 mgm. per cent. while a simple transudate will have less than 2·5 mgm per cent. protein.

Some authors (Davis and Alexander, 1959) regard the danger of intracranial connections with the ventricular system or subarachnoid space as being so great that they advocate craniotomy as a first stage. This seems rather a radical procedure but should certainly be borne in mind when an intracranial extension is suspected.

The differential diagnosis of the extranasal type includes nasal dermoids and hæmangioma. The nasal dermoid is always midline, whereas the glioma is more commonly to one side of the midline, and the dermoid is cystic in consistency and frequently has an overlying sinus. The hæmangioma often has discoloured overlying skin.

## Treatment

Treatment of these lesions is by surgical removal. In the case of the intranasal glioma there may be nasal obstruction demanding fairly early surgery: in addition the occasional occurrence of an embryonic rhabdomyosarcoma in the nose demands early removal and histological examination of any nasal polyp. The extranasal glioma demands excision largely for cosmetic reasons, and a suitable time for operation may be chosen. Since there is no evidence of malignancy wide excision is not indicated. The tumours do not appear to be radiosensitive.

## Summary

The occurrence of ectopic glial tissue in the nasal region is rare. Fifty seven cases have been reported since 1900 and recent literature is reviewed. Eight new cases are reported and the ætiology and differential diagnosis discussed.

## Acknowledgements

I am grateful to my colleagues at The Hospital for Sick Children, Great Ormond Street, and the Queen Elizabeth Hospital for Children for permission to present their cases.



https://doi.org/10.1017/S0022215100060333 Published online by Cambridge University Press

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