EXOPHTHALMOS

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EXOPHTHALMOS is defined as a forward displacement of the eyeball and may be caused by

1. Increase of orbital contents.
2. Loss of tone or paralysis of extra-ocular muscles.
3. Congenital abnormalities of the eyeball or bony wall of orbit.

The following is a report of 22 cases of exophthalmos which have been under the care of Mr. Gilbert Howells at Moorfields and the Royal National Throat, Nose and Ear Hospital in 1955. All these cases were first seen at Moorfields Eye Hospital having first been referred there on account of their eye symptoms and after investigation referred to the E.N.T. clinic.

Case Reports

They are conveniently divided into four main groups:

A. Sinus infection.
B. Neoplasm.
C. Endocrine disorders.
D. Congenital.

A. *Exophthalmos secondary to sinus infection*

This is the largest group and can be subdivided into two:

1. Children (aged 8-15 years)

(1) Four days' history of proptosis of left eye, which was displaced downwards and outwards with chemosis and œdema of eyelids. Pus was present in left middle meatus and sinus X-rays showed opaque left antrum and ethmoids. With routine treatment the condition cleared in 5 days.

(2) One day's history of left proptosis with eyeball displaced downwards and outwards associated with chemosis and œdema of eyelids. Mucopus was present in the middle meatus and X-rays showed opaque left antrum. With routine treatment the condition cleared in 9 days.

(3) Six weeks' history of intermittent swelling above left eye followed by acute pain, proptosis and œdema of left eyelids. Mucopus was present in left middle meatus and X-rays showed all sinuses opaque with erosion of left frontal bone suggestive of osteomyelitis. With routine treatment the condition cleared in 35 days.

(4) Three days' history of right proptosis with œdema of eyelids and

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chemosis. Mucopus in right nose. X-ray showed opaque right antrum. Routine treatment. In hospital for 12 days and symptoms cleared.

(5) Eight months' history of proptosis with eyeball displaced downwards and outwards. No chemosis. No alteration with routine treatment until small sub-periosteal abscess appeared above eyeball. Incised and drained and eye returned to normal.

(6) Left proptosis for 2 weeks. Palpable swelling above left inner canthus. Mucopus in left middle meatus. X-rays showed opaque left fronto-ethmoidal cells. Condition persisted with routine treatment. Left intranasal ethmoidectomy performed. The condition resolved completely within 2 weeks.

2. Adults

(7) Female, aet 32. Swelling of right eye for 2 months associated with frontal headaches and nasal discharge. Eyeball displaced down and out. Movements full. Œdema of both lids present. Pus present in right middle meatus. With routine treatment infection persisted and so right external fronto-ethmoidectomy was done where dehiscence found between ethmoidal cells and orbit. Condition rapidly resolved and 2 weeks later no proptosis present.

(8) Male, aet 37. Five years' history of steadily increasing proptosis of right eye which was displaced downwards and outwards, associated with intermittent headaches. Movements were full. Eyesight was normal. Soft swelling above right inner canthus palpated. N.A.D. in nose or postnasal space. Treatment was right external fronto-ethmoidectomy and a mucocele from the ethmoidal sinuses found communicating with orbit. Mucocele removed and fronto-nasal duct enlarged. Proptosis greatly improved at once.

(9) Female, aet 38. Seven months' history of left proptosis associated with swelling above left inner canthus. Patient complained of some recent pain. Firm diffuse swelling above left inner canthus was palpated and left eye displaced down and outwards. There was some limitation of movements upwards of eyeball. Mucopus was present in both middle meati of the nose and in the postnasal space. With routine treatment infection persisted and so bilateral intranasal antrostomy was carried out and the infection subsided. One month later swelling had disappeared.

(10) Female, aet 48. Six months' history of swelling above right eye and associated with proptosis and epiphora. Small swelling above right inner canthus was palpated and right eyeball displaced outwards. Pus present in right middle meatus. Left chronic frontal sinusitis and osteomyelitis of frontal bone 12 years previously. Bougies passed into right fronto-nasal duct with escape of pus and swelling subsided. Condition, however, recurred three months later and intranasal antrostomy was

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carried out and though occasional frontal pain still occurs the swelling and proptosis have not returned.

(11) Male, aet 49. Two months' history of left proptosis and diplopia. Eyeball was displaced laterally. Nose and postnasal space clean. Sinus X-ray showed cloudy left sphenoid and ethmoids. External ethmoidectomy and exploration of sphenoids showed thickened polypoidal mucosa. Left fronto-nasal duct enlarged and Portex tube left in for 6 weeks. Eye gradually improved but even two months later slight displacement still.



FIG. 1.

Showing left proptosis secondary to ethmoidal infection in child aged 15 years.

(12) Female, aet 56. Ten days' history of sudden onset of right proptosis. Eyeball displaced down and outwards with chemosis and œdema of eyelids. No history of trauma. There were two previous attacks of proptosis of this eye 27 years and 6 years ago. X-rays showed cystic area with well-defined margins in roof of right orbit. As routine treatment showed no change exploration of orbit was done and a cyst filled with altered blood was found in the subperiosteal tissues of orbit communicating with a cavity in the frontal bone. The frontal sinus was normal. Pathological report of the cyst showed it to be granulation tissue only. Rapid resolution of the chemosis occurred though 2 months later some proptosis can be seen to be still present (Fig. 1).

(13) Two weeks' history of infection of upper respiratory tract followed by pain left side of face and forehead with left proptosis and chemosis

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with diplopia. Left eye displaced forward and laterally. Movements limited. Mucopus left side of nose and in postnasal space. She had been given antibiotics before being referred to the clinic. X-rays showed opaque antra, ethmoids and left frontal and antral washout produced mucopus. Antral lavage was repeated, but infection persisted though proptosis gradually subsided. Bilateral intranasal antrostomy was carried out and infection cleared within 10 days, and no further trouble has recurred since then.

B. *Neoplasms*

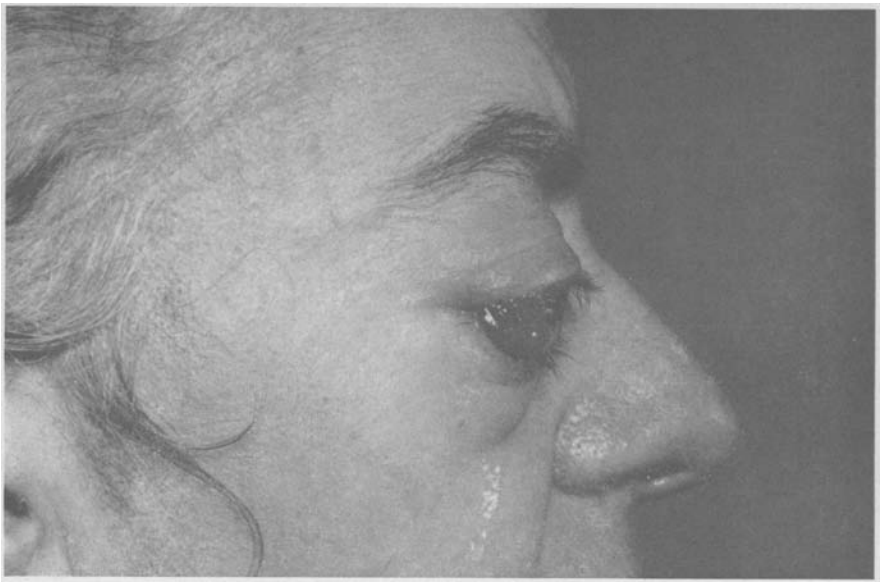
(1) Ossified fibroma of optic nerve. Female, aet 35. Eighteen years' history of left proptosis which followed left-sided blindness 2 years previously. Recently complained of left-sided headaches. On examination there was a proptosed left eye, movements full, and left fundus showed complete optic atrophy. X-rays showed calcified mass in the region of optic nerve, with no erosion of optic foramen seen in tomographic view. As the tumour was not accessible *viâ* external frontal or Caldwell Luc approach the exophthalmos has been measured by an exophthalmometer and if it increases over the next few months a transfrontal approach to the tumour will be carried out.

(2) Eosinophil granuloma of orbit. Male, aet 49. Eighteen months' history of left proptosis, worse recently with diplopia and impairment of vision. On examination proptosed left eye displaced downwards. Limitation of movements upwards. Optic disc normal. Nil else abnormal in E.N.T. or C.N.S. Orbit explored and thickened external rectus muscle found. Biopsy taken of orbital process of frontal bone and muscle. The former showed erythroid and myeloid cells with excess eosinophils and plasma cells. The latter showed muscle degeneration with loss of striation and vacuolation. There was only temporary improvement of symptoms and the condition recurred a few months later. The patient is now receiving a course of radiotherapy.

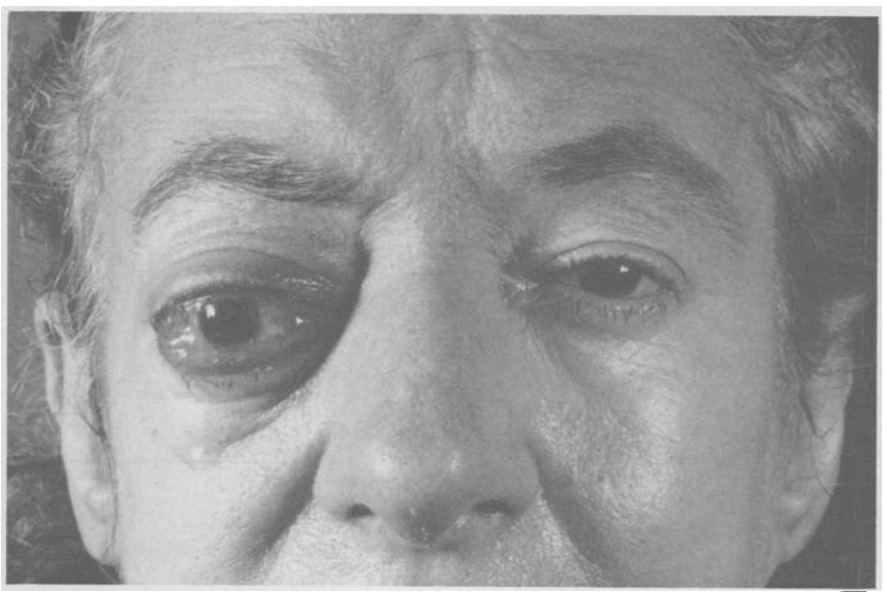
(3) Non-specific reparative granuloma of orbit. Female, aet 36. Six years' history of right proptosis. No nasal symptoms. Eye displaced laterally and soft mass present above right inner canthus. Movements full and eyesight normal. N.A.D. in nose or postnasal space. Sinus X-ray clear. Right external frontal operation showed firm extra-periosteal tissue in medial part of orbit, adjacent to ethmoidal cells. Section report of tissue of orbit was reparative, non-specific granuloma, with dense fibrous tissue. The eye has not returned to normal and the patient is being kept under observation as an out-patient.

(4) Rhabdomyosarcoma of orbit. Child of 2. Four weeks. history of progressive proptosis and chemosis. Child otherwise appeared healthy. Right eye proptosed forwards and downwards. Soft mass palpated above the right eyeball. The cervical glands were not palpable. Nose appeared

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a

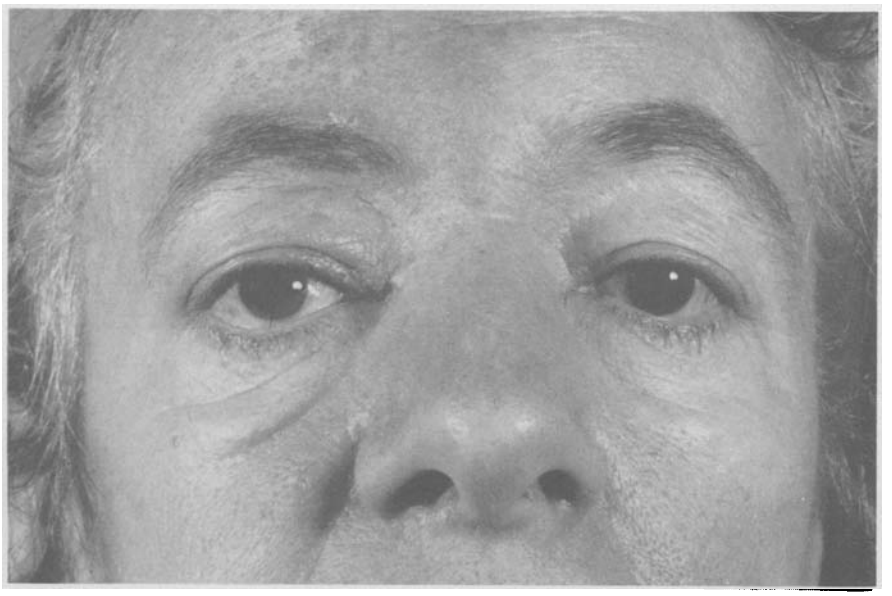


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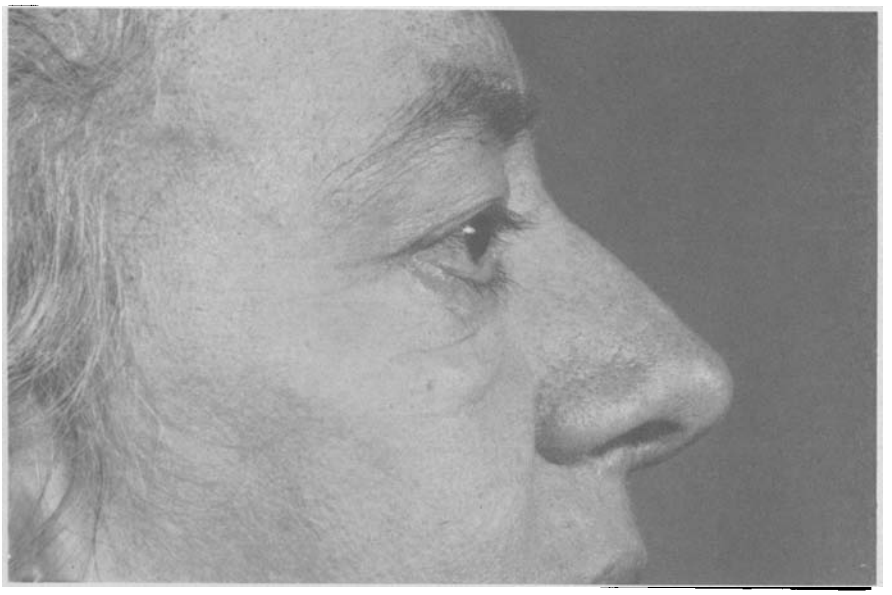
FIG. 2.

a and *b*. Showing right proptosis and chemosis secondary to venous thrombosis of orbit probably following an ethmoidal infection, in a patient aged 56 years.

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c



d

FIG. 2.

c and *d*. Same case, after treatment six weeks later.

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clean. Sinus X-ray showed opaque right antrum, but antral washouts were clear. Condition progressed. Biopsy of swelling showed it to be a rhabdomyosarcoma. Treated with L.V.T. 2205 r. in 31 days, followed by complete disappearance of proptosis, but recurrence of signs less than 3 weeks later. Given 4000 r. on 2 million volts. The right eye was removed and as neoplasm was still present, radium was given locally—3000 r. in 72 hours. Tissue shrank under treatment but 2 weeks' later recurrence of tumour tissue and child died 10 months from onset of symptoms.

C. *Endocrine disorders*

(1) Male, aet 40. Four months' history of proptosis directly forward. No limitation of movements and eyesight normal. N.A.D. in nose and postnasal space. Sinus X-rays clear.

(2) Female, aet 54. Four months' history of right proptosis forwards and slightly downwards. No tumour felt. Nose and postnasal space clear. Sinus X-rays clear.

Both these cases have been investigated by physicians who report that the exophthalmos is due to pituitary overactivity without at present any thyrotoxicosis, which may develop a year or more after the proptosis.

D. *Congenital lesions*

(1) Female, aet 22. History of 5 years' left proptosis with variable swelling above the outer angle of left eye. X-ray showed a translucent area with bony margin in roof of left orbit separate to the frontal sinus. On exploration of the outer part of orbit a smooth mass was found below roof of orbit communicating with a cavity in the frontal bone. The mass was removed and found to contain sebaceous material with hair. Section reports showed sweat glands and areas of hyperkeratosis. Left eyeball is still slightly proptosed 2 months later.

(2) Female, aet 30. History of left proptosis which she had had all her life with no variation. Her eyesight was nil on this side. All sinuses were normal and the proptosis was due to an extreme degree of myopia.

Discussion

Of the 22 cases of exophthalmos two-thirds were caused by infection of the paranasal sinuses and nearly half of these were in children aged 8-15 years. After routine E.N.T. examination special investigations were carried out in all cases—(1) Sinus X-rays, (2) Culture and sensitivity tests of nasal discharge. Treatment with bed rest, nasal decongestants, appropriate antibiotics and antral lavage cleared up the majority of infections but where infection persisted operative measures to drain the infection of the sinuses were carried out. It is essential, however, that surgical treatment in any acute stage of sinus infection with orbital infection should be minimal and confined to simple drainage or, in the case of the frontal sinus,

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FIG. 3.
Left proptosis due to an ossified fibroma of optic nerve of 18 years' duration.



FIG. 4.
Right proptosis of 6 years' duration due to non-specific reparative granuloma of orbit.

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FIG. 5.
Right proptosis in child aged 2 due to rhabdomyosarcoma of orbit.



FIG. 6.
Left unilateral proptosis due to an extreme degree of myopia.

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decompression. Later, when the acute stage has settled, more extensive surgery, if required, may be more safely undertaken. It is interesting to note that the majority of cases in children resolved with conservative treatment, whereas all cases in adults operative measures were required. There were only three cases of exophthalmos caused by neoplasms. The rhabdomyosarcoma produced a progressive painless proptosis without any infection of the nose, which in spite of it being radiosensitive was not radiocurative. Of the two congenital lesions, a dermoid cyst was found in the usual place in the upper and outer angle of the orbit. The other case is a rare one of unilateral exophthalmos due to extreme degree of myopia, with lengthening of the antero-posterior length of the globe, producing forward displacement and a pseudo-exophthalmos. Two cases of unknown ætiology may be placed in the endocrine group. In these the eye signs have preceded other signs of pituitary over-activity. These cases are kept under observation both by the E.N.T. clinic and also by the physician.

Summary

The above show a series of cases which have in twelve months been seen in an E.N.T. clinic in an eye hospital. They are not the only ætiology of exophthalmos but do represent the more common causes of unilateral exophthalmos.

I wish to thank Mr. Gilbert Howells for his permission to publish these cases and for his help on this report and Mr. J. C. Connolly of the Photographic Department of the Royal National Throat, Nose and Ear Hospital for the photographs.

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