E:/Biomedica/Biomedica/Vol. 21, Jul. – Dec. 2005/Bio-14 (A)

# OCULAR AND PERIOCULAR DERMOID CYSTS; A CLINICO-PATHOLOGICAL STUDY

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The purpose of this study was to evaluate the different clinical presentations, morphology and management of dermoid cysts involving the eye and orbit. This is an interventional case series. All cases of ocular and periocular dermoid cysts operated between January 2000 and July 2005 were included in the study. Inclusion criteria were all peri-ocular swellings which had a histological diagnosis of dermoid cyst and were seen on the globe and near the orbital rim. Patients with medial and orbital dermoids underwent CT scan to rule out intracranial extension. Patients were followed up for 1 to 3 months to observed any recurrence. There were 36 cases of dermoid cysts out of which 7 were limbal, 11 medial orbital, 15 lateral orbital and 4 deep orbital. Two limbal dermoids were associated with pre-auricular skin tags. Most of the growths presented with slowly advancing lesions. Proptosis and displacement of the globe was produced by orbital and large medial dermoid. All cysts were removed completely and sent for histopathology. The cysts were lined with stratified squamous epithelium, underlying dermis and skin appendages. There was keratin, sebaceous material and hair inside the cavity. The orbital dermoids that to be drained before excision of the posterior wall. There was rupture of 2 medial dermoids while dissecting them from the periosteum. There were 3 referred cases of recurrent dermoid cysts out of which 2 were lateral and one orbital, which were removed successfully. Follow up was done from 1 to 3 months. There was late infection in one of the orbital dermoids which responded well to intravenous antibiotics. One patient with recurrent orbital dermoid had a frozen orbit on presentation which improved after surgery but she needed ptosis repair later. There was severe visual loss in one case of deep orbital dermoid. Inconclusion orbital dermoids should be removed carefully and completely to prevent recurrence and scarring of orbital contents.

#### **INTRODUCTION**

Dermoid and epidermoid cysts are examples of choristomas, tumors that originate from aberrant primordial tissue. The result is normal-appearing tissue in an abnormal location. As 2 suture lines of the skull close during embryonic development, dermal or epidermal elements are pinched off and form cysts, which are adjacent to the suture line. Approximately 50%<sup>1</sup> of these tumors that involve the head are found in or adjacent to the orbit.

Orbital dermoid cysts may displace structures in the orbit, especially the globe. If the displacement is great, interference with vision by compression of the optic nerve may result, or ocular motility may be disturbed. We report 36 cases of dermoid cyst present in different locations around the orbit along with their morphology and management.

#### MATERIALS AND METHODS

All cases of ocular and periocular dermoid cysts operated between January 2000 and July 2005 were included in the study. Inclusion criteria were all peri-ocular swellings which had a histological diagnosis of dermoid cyst and were seen on the globe and near the orbital rim. Patients with medial and orbital dermoids underwent CT scan to rule out intracranial extension. Patients were followed up for 1 to 3 months to check for recurrence.

Medial dermoids were removed using a medial skin crease incision except in one case of a large cyst which was removed using a lynch incision. Lateral cysts were removed using either an upper lid crease, sub-brow, supra-brow or through the brow incisions. Orbital dermoids were removed using a lateral orbitotomy in 2 cases and sub-brow incision in one case. The orbital dermoids had to be drained before excision of the posterior wall.

### RESULTS

There were 36 cases of dermoid cysts of these 7 were limbal, 11 medial orbital, 15 lateral orbital and 4 deep orbital (table 1). Most of the growths presented with slowly growing lesions and were more prominent in children than adults. The orbital dermoids and large medial dermoids produced proptosis and displacement of the globe.



Figure 1: Limbal dermoid.

Limbal dermoids (figure 1) were seen in the infero-temporal quadrant in all cases straddling the limbus with larger part of the growth involving the cornea. Two limbal dermoids were associated with pre-auricular skin tags. Only 2 lesions were large enough to involve the visual axis. All of them produced varying degree of corneal thinning beneath. Corneal perforation did not occur in any of the cases at the time of excision. All patients had varying degree of scarring with the larger lesions requiring a corneal graft.



Figure 2: Typical medial dermoid cyst.



Fig. 3: Recurrent lateral dermoid beneath brow scar.

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Figure 4: Orbital dermoid with remodelling of roof.

Table 1: Clinical data of Ocular and Periocular Dermoids

Location	Cases	Rt side	Lt side	Age (yrs)	Size (mm)
Limbal	7	2	5	1-20	4 - 8
Medial	11	5	6	2-30	1 – 3
Lateral	15	8	7	5-25	1 – 2
Orbital	4	3	1	20-25	2-3

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Medial dermoids (figure 2) were generally smaller in size compared with the lateral ones (Table 1). All of them were attached to the periosteum to a varying degree. Complications were seen more frequently in orbital dermoids compared with others (table 2). There was rupture of 2 medial dermoids while dissecting them from the periosteum. Lateral dermoids (figure 3) were present above or below the brow and around the lateral canthus. All patients with orbital dermoids were drained before excising the posterior wall in order to facilitate dissection at the base. One patient with orbital dermoid developed central retinal artery occlusion with significant loss of vision after removal of the cyst. After excision of the cyst the wound was thoroughly irrigated with saline. There were 3 referred cases of recurrent dermoid cysts of these 2 were lateral and one orbital, which were removed successfully. No patient developed significant inflammation which needed oral prednisolone. One orbital dermoid had remodelling of the orbital roof with no intracranial extension (figure 4).

All cysts were removed completely and sent for histopathology. The cysts were lined with stratified squamous epithelium, underlying dermis and skin appendages. There were keratin, sebaceous material and hair inside the cavity.

Cases were followed up for 1 to 3 months. A late infection appeared in one of the orbital lesion which responded well to intravenous antibiotics. One patient with recurrent orbital dermoid had a frozen orbit on presentation which improved after surgery but she needed ptosis repair later.

Complications	No. of cases	Туре
Significant visual loss	1	Orbital
Rupture	2	Medial
Frozen orbit	1	Orbital
Ptosis	1	Orbital
Post operative infection	1	Orbital

Table 2 Complication in Orbital Dermoid

## DISCUSSION

These tumours are commonly noticed initially in young children but they may appear or grow at any age. Commonly they are seen unilaterally but bilateral cases have also been reported<sup>2</sup>. Orbital dermoids are commonly seen medially or laterally around the suture lines. We found lateral angular dermoids to be more common than medial ones. Sherman et al found equal number of medial and lateral dermoids<sup>3</sup>. All deep dermoids were lateral in our study. Patients generally complain of a mass, which is visible in the orbital area. Growth of these lesions is generally slow. In adults, dermoids may become symptomatic for the first time and grow considerably over 1 year. Based on this fact, some workers conclude that these lesions may be dormant for many years or have intermittent growth morbidity is usually of cosmetic nature; more rarely, proptosis and diplopia may result. A traumatically ruptured dermoid may result in dramatic orbital and periocular inflammation.

The orbital cysts are classified as exophytic and endophytic, according to their site of attachment in relation to the orbital rims. This classification can explain the different natural history of these lesions. The exophytic cysts growing externally are discovered in childhood, whereas the endophytic ones are discovered later in life when they produce bone damage, with or without invasion of the adjacent structures<sup>4</sup>.

In children the most common location is in the superior temporal aspect of the orbit. The mass is generally less than 1 cm in diameter, non tender, and oval-shaped. Usually, little displacement of the globe occurs. Because it has no attachment to the skin, it can be differentiated from a sebaceous cyst. The cyst usually is tethered to the periosteum of the bone near suture lines, including the sinuses or intracranial cavity. In adults the cysts are palpated less easily and have more vague borders. They are more likely to displace the globe, possibly growing or eroding their way into adjacent structures.

In patients not having symptoms or signs of inflammation, most periocular dermoid cysts show histological evidence of inflammation due to leakage of the lipid and keratin contents from the cyst, the incidence being similar at all ages<sup>5</sup>. If the cyst ruptures, either spontaneously or with trauma, a pronounced inflammatory response will occur that may mimic orbital cellulitis. The inflammation may be suppressed by corticosteroids, but excision is required to prevent recurrence.

Rarely, the cyst may press on the optic nerve and create the typical symptoms of optic nerve compression. More rarely, the cyst may induce diplopia by physically restricting movement of the globe or by compressing cranial nerves III, IV, or VI. Cysts have been reported to occur within the recti muscles as well<sup>6</sup>.

Differential diagnosis includes mucocele, encephalocele, echinococcus cyst and sebaceous

cyst. Ruptured dermoid cysts may mimic rhabdomyosarcoma, pediatric metastatic cancers and orbital cellulitis. B scan ultrasound can differentiate between a solid and cystic lesion<sup>7</sup>. X-ray films often show radiolucent defects where the cyst has eroded into the bone. These defects can be large with distinct margins, which may show sclerotic changes. CT or MRI studies have largely supplemented plane x-ray studies for evaluating dermoid cysts. Lesions appear cystic or show fat density. The presence of a margin or rim, often partially calcified is usually identified. Irregular scalloping of adjacent bone is a highly suggestive feature<sup>8</sup>. These studies may be indicated, if the posterior extent or the cyst cannot be palpated.

The external layer of the cyst has variable thickness and may be exceedingly thin. The cyst is connected to periorbit by fibrovascular tissue. Epidermoid cysts have a lining of epithelial cells, usually stratified, that produce keratin. Dermoid cysts contain blood vessels, fat, collagen, sebaceous glands, and hair follicles. The material in the cyst varies from a tan oily liquid to a white or yellow substance that resembles cottage cheese or even a relatively solid mass. Often, high cholesterol content is present. The cysts commonly are inflamed<sup>5</sup> and may contain free blood.

Dermoid cysts usually are a cosmetic problem which are excised completely using an approach that is appropriate to the location in the orbit. We used lid crease incision in medial dermoids and some lateral dermoids. Cysts around the brow were excised using incisions below, above and through the brow. Lynch incision was used in one large medial dermoid and lateral orbitotomy was used in deep orbital dermoids, Lid crease incision has been reported for lateral angular dermoids around the brow with good cosmetic results<sup>9,10</sup>. Lateral orbitotomy is also used commonly for dumb bell shaped dermoids<sup>11</sup>.

Inflammation from preoperative or interoperative rupture of the cyst can be controlled by prednisolone. The entire cyst must be excised to avoid persistent inflammation, a draining sinus, or recurrence of the cyst. In our patients we did not find significant inflammation post operatively in ruptured cysts. We thoroughly washed the area with normal saline and used suction to drain the cyst at the time of rupture.

Dermoid cysts generally have a benign prognosis. If they are excised completely, usually

only a minimal scar occurs. If they are observed rather than excised, slow growth can be expected. However, patients should be explained that these tumours are benign.

It is thus **concluded** that superfiicial dermoid cysts are easy to remove with relatively few complications. Deep dermoids should be removed after careful planning to prevent long term complications.

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