Introduction

Dirofilaria is a filarial worm of carnivorous animals. It affects the ocular and periocular tissues. Zoonotic dirofilaria occurs widely throughout European, African, Middle eastern and Asian countries. Cases from India have been reported. Man is a dead end for the parasite and it causes severe inflammatory reaction in the host. It has been reported in the subcutaneous tissue, subconjunctival space, in the lacrimal gland and as an intraocular parasite. This is the first report of dirofilaria in an extraocular muscle.

Case Report

A 24 year young lady presented with swelling in right eye since 5 months. There was no complaint of pain redness in right eye. She consulted a local doctor who diagnosed it as a scleral nodule and started topical antibiotics and steroids, but there was no change in size of nodule. She had no complaint of double vision.

Ocular examination revealed minimal congestion nasally. There was a 0.5 cm grey white nodule, 1 mm medial to nasal limbus at 3 o’ clock position which was firm in consistency and attached to sclera. There was no sign of uveitis. Rest of the ocular examination was normal. Visual acuity was 6/6 in both eyes. Intraocular pressure was normal in both eyes. All haematological tests were normal except a raised ESR.

The nodule was excised under local anaesthesia. After separating the nodule from the overlying conjunctiva the cyst was found attached to the medial rectus muscle and was separated by blunt dissection and removed enbloc. The patient was put on oral systemic steroids for a week with oral serratiopeptidase to decrease inflammation. Patient did not have any other foci with the worm. She has been followed up for 2 years, has a visual acuity of 6/6 with no recurrence locally or elsewhere and no recurrent ocular swelling.

Histopathology showed a cyst containing a worm identified as Dirofilaria with surrounding granulomatous inflammation.

Pathological Findings

The identification of dirofilaria is based on the microscopic features of individual parasite including a thick laminated cuticle with external longitudinal ridges and the presence of well developed circumferential musculature interrupted by 2 lateral cords. The number of reproductive tubes and their content (egg, microfilaria) help to determine the sex of the parasite and the reproductive state of female worm. [Fig 1, 2,3]

Discussion

Ocular dirofilariasis is a form of subcutaneous dirofilaria caused by Dirofilaria repens. The infection is transmitted to humans accidentally, by insect vector like mosquito. Humans are the dead end for the parasite. In human infection, parasite development is impaired and microfilariae are not produced. The most common involvement in the eye is in the conjunctiva.
and periorbital region. Subconjunctival involvement is common. Other ocular involvement includes inflammatory reaction, uveitis and glaucoma.

Fig. 1. Transverse section of immature female Dirofilaria Noch demonstrating central uteris outer cuticle with intervening muscle

Fig. 2. Section of the worm along with surrounding granulomatous inflammation

Fig. 3. Section showing high power view of the same

Periocular Dirofilariasis presents as inflammatory painful mass lesion. Patient presents with inflamed subcutaneous nodules that are painful, erythematous and sometimes migratory. The diagnosis is confirmed by studying the morphology of the worm after their removal. These have thick laminated cuticle, broad elongated ends and large muscle cells. Length of the female worm varies from 8 to 13 cm and males from 4 to 4.8 cm. The recommended treatment is surgical removal of the mass including the worm. It is important to identify the nematode as *Dirofilaria* to avoid treatment with antihelminthic agents.

*Dirofilaria* is a zoonotic infection by filarial nematode of genus *Dirofilaria*. Humans are aberrant/accidental hosts for *Dirofilaria*asis. In humans the worms usually die before maturing provoking a focal granulomatous reaction in subcutaneous tissue or small pulmonary infarcts. There are 2 subgenera – *Dirofilaria dirofilaria* and *Dirofilaria nochtiiella* based on absence or presence of external longitudinal cuticular ridges (Nochtia). Approximately 20 species of *Dirofilaria* are in subgenus Nochtia but only *D. repens*, *D. tenius* and *D. striata* infect humans. Four species of *D. Nochtia* were once called *D. conjunctivae*, *D. tenius*, *D. ursi*, *D. subdermata* and *D. striata*. Useful characteristics for differentiating between *Dirofilaria* species are the size and features of the body wall. i.e., thickness of cuticle, its structure, ridges, lateral chords and number and type of muscle cells.

Adult female is the definitive host – 230-310 mm long and 1-2 mm in diameter and are longer than males (120-190 mm). Females have 2 sets of tubular reproductive organs. All *Dirofilaria* that infect human have a multilayered striated cuticle and prominent lateral cords. Only immature worms lodge in human pulmonary vessels. These worms are 100-350 mm in diameter and are partially degenerated in tissue section. Mosquitoes deposit larvae in human subcutaneous tissue which may provoke lesions. Some larvae migrate to heart and die. Dead worms produce infarcts that they lodge in pulmonary vessels. Worms localise most frequently in tissue of orbit, scrotum, breast, arm or leg.

Worm infestation in extraocular muscle (EOM) have been reported extensively in literature. Most innumerable are those of myocysticercosis.
many of them being from India. Cysticercosis can be picked up on neuroimaging and responds to oral steroids and albendazole, requiring surgical intervention only rarely. Sparaginosis (Tapeworm) in EOM have been reported, as also the hydatid cyst.

References