Wooden Foreign Body in the Orbital Cavity : A Case Report

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Abstract

Orbital foreign bodies in Thailand are uncommon. The diagnosis depends on history taking, physical examination and complete investigations. A case of orbital foreign body was reported with satisfactory result of treatment by transethmoidal approach: ethmoidectomy with antrostomy.

There are less than 10 reports of intraorbital foreign body a year. One report analyzed 104 cases of traumatic lesions of the orbit[1]. Orbital fracture, sinusal mucosal swelling and bleeding occurred in 3/5 of the cases. The incidence of intraorbital foreign body, periorbital injuries (retrobulbar, intrabulbar bleeding and ruptured globe which occur in 1/50 of the total number of orbital lesions), orbital emphysema and neighboring paranasal sinus injuries are all approximately 1/4 of the orbital fractures[1]. The severity of intraorbital foreign body injuries vary according to the size, location, velocity and composition[2,3] as well as associated intracranial[4-16], globe[2,3,17] and paranasal sinus injuries[3,8,18]. The frequent interdepartmental care should be alert. Inert metallic substances: silver, gold, platinum, aluminum, zinc etc.: nonmetallic: plastic, glass, silica etc. usually do not need removal[2,3,19,20]. The inert substances may need removal if compressed on vital structures such as the optic nerve, blood vessels and muscles[2,3].

Substances which need removal are reactive metallic substances: iron which causes siderosis bulbi[19-21] and copper alloy which causes chalcosis[2,20,22] as well as reactive organic substances: bee's or wasp's sting[23] and wood which causes granulomatous reaction and chronic fistula[2,16,24,25]. The resolution of CT scan are 0.2-2 mm with 3 mm cut with all substances[27], excellent with metallic substances but less accurate with non-metallic such as a wooden foreign body[5,16,17,19,25-30].

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CASE REPORT

We report a case of intraorbital foreign body: A 20 year old male had had a motorcycle accident 1 month before being referred to our hospital. He was admitted in a secondary referring hospital for 27 days due to head injury and persistent right eye swelling with a provisional diagnosis of retrobulbar abscess and went through four incisional drainages without improvement. On admission to our hospital his vision was 20/70 pinhole 20/40 on the right and 20/20 on the left. Right eye had ptosis, periorbital edema with marked conjunctival chemosis and exophthalmos 26 mm in the right eye compared to 16 mm in the left. Right extraocular muscle movement was limited in all directions with pupil 5 mm reaction to light. Needle aspiration of pus yielded no growth. Axial section, (Fig. 1) coronal section and CT scan showed an infiltrative mass supero-medial extending into the orbital apex; intraorbital density was that of consistency of fluid in the peripheral and air in the middle of the mass. One week later he had orbital exploration by Lynch's incision (Fig. 2), greenish pus was aspirated for culture. Eight pieces of casava wooden foreign body approximate volume of 5 ml was found and completeness of removal was confirmed by palpation in the wound. (Fig. 3) A drain was inserted and taken off 3 days'

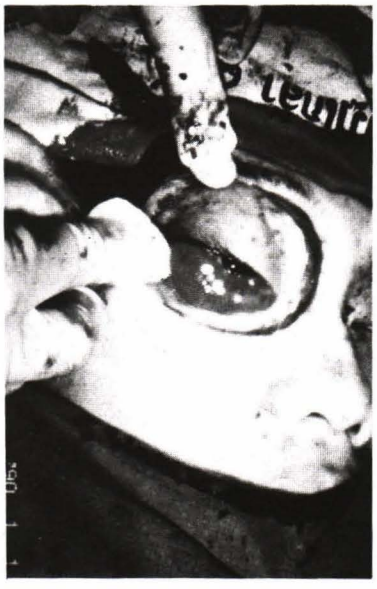

Fig. 2. At the fifth week after motorcycle accident, during his first orbital exploration with Lynch's incision. The eyes were proptosed and showed marked chemosis. The exoph thalmometer measurement were 26 mm on the right and 16 mm on the left.

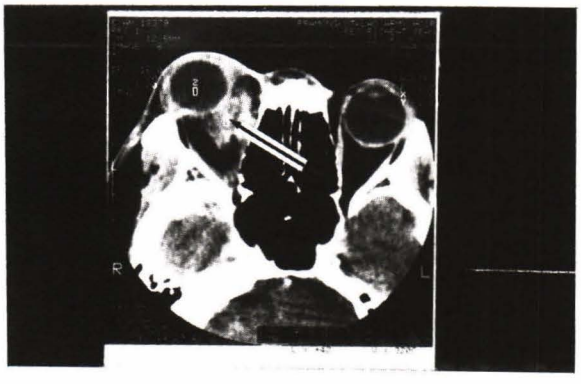

Fig. 1. Axial CT scan 1 week before exploration missed the diagnosis of wooden foreign body the arrow showed a loculated infiltration mass superomedial level of the section extending to the orbital apex with its density consistent with fluid in the periphery and air in the middle of the mass.

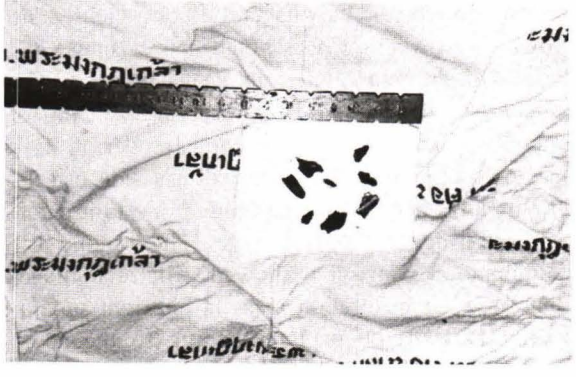

Fig. 3. Eight pieces of flat wooden foreign body which were removed out of the exophthalmic retrobulbar abscess eye. These foreign body were probably of one piece origin that penetrated into the orbit but they were very fragile resulting in fragmentation and the buck of the wood easily peeled off from its core during removal. The ruler scale was in inches.

Fig. 4. After the second exploration and ethmoid-orhinotomy on the fifth month of follow-up, no more recurrence was found. The exophthalmos decreased from 26 to 20 mm compared with 16 mm on the normal fellow eye. The complication noted were medial ptosis, medial canthal downward displacement, exotropia causing diplopia.

post operatively. The pus and flecks yielded no growth but mycelium was noted in wet smear and antifungal drug amphotericin B was started. The patient was discharged after receiving 775 mg of amphotericin B slowly, intravenously over 40 days due to his intolerability of the drug's side effects. One month later he was readmitted due to a recurrent swelling in the right eye. The second CT examination; axial view showed a more homogenous irregular infiltration mass in his right superomedial part of the orbit extending to the apex; coronal views located the mass superior to the medial rectus. On reexploration a little pus was found and yielded no growth. The mass was a periorbita fibrosis. Ethmoido-rhinotomy was done. Histopathology showed granulomatous type of foreign body with multinucleated giant cell. Amphotericin B was continued to the total dose of 2010 mg followed by itraconazole 100 mg (sporal) 2 tablets 2 times a day for 1 month. Five months post operatively there was no recurrence (Fig. 4).

RESULTS

The patient's vision was 20/30 pinhole, not improved on the right and 20/20 on the left. Exophthalmos decreased from 26 to 20 mm on the right compared to the same 16 mm status on the left. Complications were exotropia causing diplopia, medial ptosis and medial canthus downward displacement (Fig. 4) which were all corrected with several procedures at the fifth month of follow-up.

DISCUSSION

The management and complications of intraorbital foreign body can be divided into 3 stages[2,3]. Firstly, the semi-emergency management of the immediate compression effect to vital structures; blood vessel, muscle (caused exotropia in this case), nerve and hemorrhage. Secondly, the intermediate complications are of the infection and granulomatous inflammation and subcutaneous emphysema. Thirdly, the late complications are chronic inflammation, migration of the foreign body, scar tissue, foreign body granuloma, fistula and restriction of motility. The keys to successful treatment in our patient were: firstly lateral Ethmoido-rhinotomy to drain all the accumulation of infection from the residual foreign body as the nidus of inflammation, from the orbit to the anterior ethmoid and passed through the nasal cavity; secondly, treating the residual tissue fungus with amphotericin B[31] to the accumulating dose of 2 g then covering with itraconazole 200 mg one day afterward for one month; there was no more recurrence. The treatment of the intraorbital foreign body was as follows: Firstly, detect the simultaneous associated injury to the eye, optic nerve and brain etc. The traumatic optic neuropathy needed a megadose of steroids. Though not all metallic foreign bodies need removal, they are easily and best localized by CT due to their hyperdensity[30]. However, nonmetallic organic foreign bodies such as wood, the removal of which is necessary, are subtle and frequently miss detection by CT. The reasons are that there has been a report[30] of two wooden foreign body cases with different density, one was neutral to minimal hyperdense of +10 Houndfield unit (HU) and the other was hypodensity of -434 to -446 HU. The later piece of wood was interpreted falsely as bubble (similar to our case; Fig. 2). This same experiment conducted

study on the CT density for wood gave results varying from -618 HU to +23 HU. The highest densities obtained for glass varied from +522 HU to -2000 HU. The density of plastic lens was -102 HU[30]. If available, MRI[5,13,30] can be used to detect highly suspicious non-metallic foreign bodies, if CT fails to demonstrate them. However, MRI can be a hazard if the foreign body is metallic and moves through vital structures during the examination. Surgical removal should balance the risk of surgical trauma against existing loss of function. The removal should be carefully done through the wound of entry if the patient comes early or by a separate incision, Lynch's incision, lateral orbitotomy etc. Our case came late and needed a separate incision. Monitoring and localization pre and during removal with fluoroscopy, portable X-ray, Berman's locator[32,33], ultrasound[34,35] and magnet extraction[36] has not been described infrequently. Surgical complications were failure of incomplete removal of the foreign body, fragmentation of the foreign body, soft tissue damage and bony damage to orbital walls which in turn might cause VA loss, diplopia, ptosis, epiphoria and medial canthal downward displacement. In one report, experience with 20 cases of intraorbital foreign body[37], they concluded that early removal of the foreign body was technically easy but less than half of their patients had been admitted early. The results of surgery were approximately, 1/3 obtained recovery, 1/3 lost vision (1/4 need enucleation, others had vision sequel to the lesion of optic nerve). Our case obtained recovery of best correct vision up to 20/30 with sequel in the visual field due to vitreous hemorrhage.

SUMMARY

We report a case of intraorbital foreign body successfully removed by Lynch's incision ethmoidectomy: Cured of recurrence by ethmoidorhinotomy. Complications and sequelae were managed with satisfactory results.

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วัสดุแปลกปลอมชนิดไม้ในกระบอกตา : รายงานผู้ป่วย

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วัสดุแปลกปลอมในกระบอกตาพบได้ไม่บ่อยในประเทศไทย การวินิจฉัยขึ้นกับการซักประวัติ การตรวจร่างกาย และการตรวจวินิจฉัยทางห้องปฏิบัติการอย่างละเอียด ผู้รายงานได้เสนอผลการรักษาเอาวัสดุแปลกปลอมออกที่ได้ผลดี โดยการผ่าตัด ethmoidectomy ร่วมกับ antrostomy

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