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CASE REPORT

Impaled trans-palatal crochet needle impacted at skull base; a multidisciplinary management challenge.

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ABSTRACT… Pediatric oro-pharyngeal trauma is a common observation in hospital accidents & emergencies reception. Immense responsibility rests with specialized health care providers to instantly diagnose and manage a rather small proportion of life-threatening complication associated with such injuries. Postero-lateral oropharyngeal trauma carries a significant risk of major neurovascular insult. More-over such patients are exposed to high radiation exposure to face, head & neck regions. A multi-disciplinary approach involving high dependency nursing, neuro-observation, meticulous imaging, prompt surgical exploration where indicated and a cautious follow-up must be considered as neurovascular manifestation may become apparent after some days of initial injury.

Key words: Computed Tomography Angiography, Foreign Bodies, Jugular Foramina, Oropharynx, Vertebral Artery, Wounds and Injuries.

INTRODUCTION

Only one per cent of all childhood injuries account for oropharyngeal trauma.[1] Many a time, such foreign objects may pass even unnoticed, or sometimes may cause little symptoms before their retrieval; yet occasionally, their identification and recuperation can be really challenging. Accidental fall in a young child holding sharp objects like a pencil, rule scale and tooth brush, chopstick, lollipop stick etc, in hand are typical forerunners. Besides avoiding the accident, every effort must be made in meticulous diagnosis, anticipating complications and implementing most appropriate approach to explore and remove such an object.

CASE REPORT

Three years old female child was brought into the A&E reception of Combined Military Hospital, Quetta on 5 November, 2021 on account of accidental impaction of a crochet needle into her throat for past four hours. (Figure-1) Numerous attempts had been made at local hospitals to remove this foreign object with unyielding results due to possible impaction of its curved hooked end into a bony surface.

The child was finally hospitalized in pediatric critical care ward at Combined Military Hospital, Quetta, under close monitoring for airway compromise, neurologic dysfunction and hemorrhage. We carried out urgent contrast enhanced computed tomography of her brain, skull base and face, and computed tomographic angiography of her neck; which revealed the metallic shaft of crochet needle penetrating into the posterior (vascular) compartment of the right parapharyngeal space and its terminal hook impacted into the skull base just anterior to the right jugular foramina. (Figure-2) There was no evidence of vessel extravasation, retropharyngeal or mediastinal air or a fracture. A multidisciplinary team comprising of otolaryngologist, neurosurgeon, vascular surgeon, anesthesiologist and radiologist was called in to decide and undertake prompt necessary surgical intervention in the wake of

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radiologic images. (Figure-2) Informed written consent was sought from the parents regarding a possible open surgical tracheostomy in case of oro-tracheal intubation failure.

The patient was successfully intubated with sized I.D. 5.0mm cuffed Portex® endo-tracheal tube and positioned in OR table in beach-chair attitude, while a small bean-bag was placed between her shoulders. We shaved her scalp for a possible craniotomy. Her neck was rotated to left for better exposure. Standard longitudinal incision (as of carotid end-arterectomy) was marked and extended in curvature on cranial end behind her right ear over the mastoid process. 2% Lignocaine with Epinephrine (1:1000) was injected subcutaneously under incision line. We painted the surgical field with Povidone Iodine solution. She was appropriately draped over sterile Opsite® dressing. We made skin incision and continued sub-platysmal dissection on the right anterior triangle of the child's neck. Retracting away the left sternocleidomastoid muscle, the carotid sheath was opened and internal jugular vein was mobilized to be slung in soft vessel loop. We identified carotid artery and the vagus nerve, following which we carefully marked and slung the external and internal carotid vessels as well as the common carotid artery, for adequate haemostatic control. We continued surgical dissection cranially to completely expose internal jugular vein toward the left jugular foramen. We further exposed internal carotid artery by dividing posterior belly of digastric muscle, confirming the left hypoglossal, glossopharyngeal and spinal accessory nerves directly under vision in the operative field. The occipital bone was adequately exposed on left side in the region of Atlanto-axial joint. Left vertebral artery at level of third cervical vertebra C3 was skeletonized. A little exploration in the region revealed hooked end of foreign object (crochet needle) stuck at 1 mm proximity of vertebral artery trapped inside the capsule of Atlanto-axial joint. We grasped the hooked end in a straight forceps, pulled it meticulously and with the help of a wire cutter; cut away the hooked end from the shaft of the crochet needle, securing the left vertebral artery. The shaft was subsequently delivered intra-orally, and oropharyngeal wound was left to granulate. We did not encounter any untoward hemorrhage either in the operative field or intra-orally. We washed the neck wound thoroughly with sterile normal saline and closed it in layers after securing a drain in the sub-platysmal plane. Neck skin was closed with a PDS® 4/0 suture.

Figure-1. The child with impacted oropharyngeal foreign object (crochet needle), at presentation

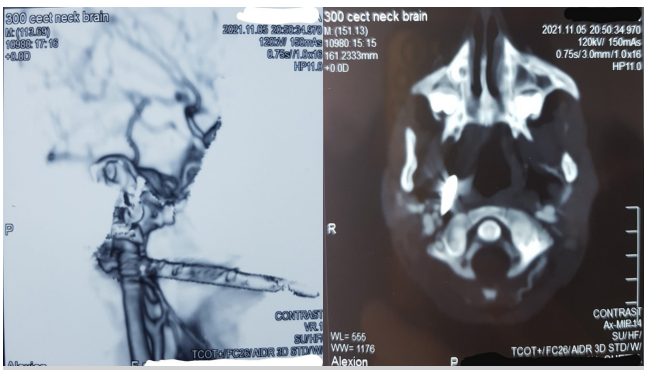

Figure-2. Pre-operative CT angiogram & CECT of the neck

The child was placed on nil-per-orum instructions for six hours post-operatively, and we closely inspected her oral cavity for hemorrhage or edema. She tolerated small sips of clear water, subsequently; meanwhile parenteral crystalloids were continued for maintenance. Oral soft semisolid meals were commenced from first post-operative day.

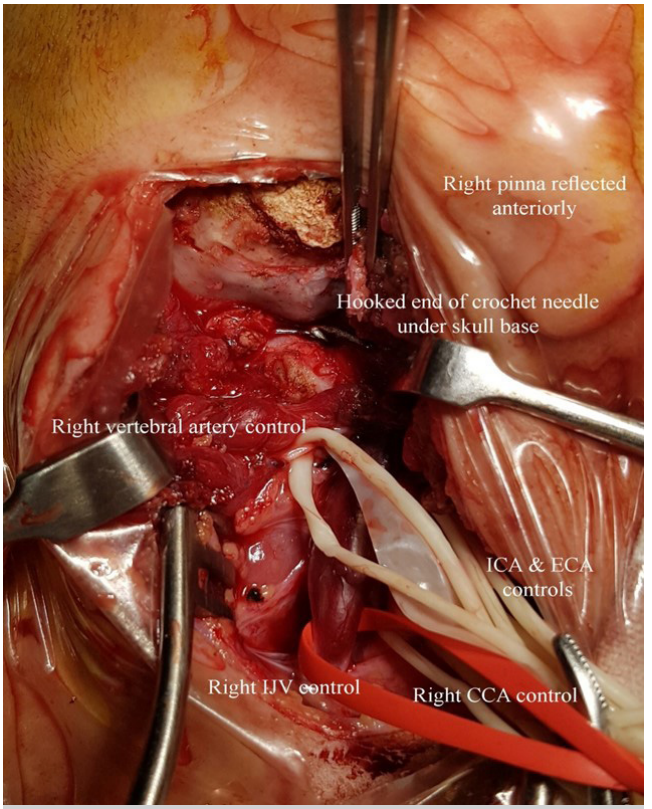

Figure-3. Curved metallic hook of crochet needle visible impacted under skull base at the end of neck exploration

Figure-4. Foreign object retrieved after cutting the (impacted) hooked end from its shaft, leaving the wound entering into right parapharyngeal space

Her physical examination after surgery revealed no hemiplegia, hemi paresis, change in her voice quality, drooling of saliva, neck hematoma or breathing difficulty. Both her tonsils appeared normal and the palatal perforation remained dry and clean. Neck drain was removed on second post-operative morning. The child was released from hospital on third post-operative day with oral Co-Amoxy Clav 250mg/5ml + 62.5mg/5ml suspension and Metronidazole 200mg/5ml suspension for next 7 days. On sixth post-operative day, her skin sutures were removed and palatal perforation was found to be healing satisfactorily.

DISCUSSION

Jackson described foreign body as an object or substance foreign to the location where it is found.[2] Penetrating oropharyngeal trauma carries significant morbidity, and may sometimes eventuate into retropharyngeal space abscess, thrombosis of internal carotid artery and potentially fatal mediastinitis.[3,4] Parental neglect, visual impairment, general and mental illness, hasty eating, poor and inadequate dentition notably predispose to accidental foreign object impaction in upper aero-digestive tract, especially at extremes of age.

Clinical presentation largely depends upon type of foreign object, precise anatomical site of the aero-digestive tract involved, the mechanism of injury and the time interval. Esophageal foreign objects usually cause retching, drooling, dysphagia and pain. However, airway foreign objects classically manifest with violent coughing, choking, wheeze, stridor or dyspnoea. Clinical presentation in either of the situation can sometimes be overlapping.

High index of suspicion in parental history and clinical examination remain the cornerstone in diagnosis. Prompt and appropriate utility of advanced radio-diagnostic facility not only confirms diagnosis, determines extent of injury, but also augments in accurate planning of therapeutic intervention. However the risk of radiation dose exposure versus the diagnostic yield must always be kept in consideration while requesting for computed tomography (CT) scans and computed tomographic angiograms (CTA), and more targeted protocols must be adopted.[5]

Soose et al graded penetrating oropharyngeal trauma to be abrasions and ecchymosis without mucosal disruption (grade-I), punctured wounds or simple lacerations ≤ 1cm (grade-II), and laceration > 1cm or any laceration with an oro-

nasopharyngeal fistula or large mucosal flap (grade-III).[6] Grade I and II perforating injuries often tend to heal even in absence of specific treatment, but, internal carotid artery thrombosis can eventuate from vascular compression further promoting luminal compromise. As cited by Jardeleza et al, Randall et al suggested three days of hospitalization for close neuro-observation in such cases due to the lucid interval before precipitation of a major neuro-vascular event. They also suggested foreign object retrieval and primary closure of the laceration in grade-III palatal perforations. Role of systemic antimicrobials had been restricted to lacerations over 1-2 cm in length.[7]

CONCLUSION

A penetrating oropharyngeal foreign object must never be removed at the scene and should only be removed under direct surgical visualization and adequate vascular control. Critical patients displaying clear signs of neurovascular insult or airway compromise must be thoroughly evaluated and planned for surgical exploration. In rather stable pediatric patients with no evident signs of deeper trauma or airway compromise, neck exploration should be kept reserved based on periodic physical examination and further dose-controlled imaging modalities over 72 hours of hospitalization.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Nadeem Ahmed Sheikh	Conceptualization, Literature search, write-up, Proof reading.	
2	Khalid Pervaiz Butt	Methodology, Write-up.	
3	Zahid Hussain	Methodology.