

Trans-oral penetrating pin Case report and literatures review

Emad S. Abbas*

MBChB, FICMS, MRCPS

Abstract:

Aim: is to report a case of trans-oral pin, penetrating base of skull and upper cervical region, which is rarely reported in the literatures and to compare it with other studies reporting similar case.

Patients Methods: the details, the presentation, both clinical and radiological finding, and surgical approach of such a case are presented.

Results: the diagnosis was verified with plain x-rays and C.T. scan with bone study. Surgery was conducted under G.A., the patient was recovered well without neurological deficit.

Conclusion: meticulous and close pre-operative care with safe operator and careful fellow up is mandatory. Surgery only offers the best chance of care.

Keywords: cervical injury, craniocervical trauma, pin trauma, trans-oral trauma.

J Fac Med Baghdad
2012; Vol.54, No. 3
Received June 2012
Accepted July 2012

Introduction:

Trauma surgeons have traditionally dividing penetrating injuries of the neck into 3 zones (1).and although definitions vary; the following is a general scheme (2).Zone 1: inferiorly from the head of the clavicle to the cricoids cartilage (include the thoracic out let).Zone 2: from the cricoids cartilage to the angle of the mandible.Zone 3: from the angle of the mandible to the base of the skull.Spinal cord injuries are fairly uncommon in children, with the ratio of head injuries to spinal cord injuries being ~30:1 in pediatrics. Only ~5% of spinal cord injuries occur in children (3).Trauma tend to involve ligamantous rather than bony injuries,due to ligamantous laxity ,together with a high head to body weight ratio ,immaturity of paraspinal muscles and underdeveloped unicate processes (3). The fatality rate is higher with pediatric spine injuries than with adults(opposite to the situation with head injuries); with the cause of death more often related to other severe injuries than to the spinal injury(4).A systemic and affective practical management of patient with spinal cord injury can improve the overall out come. A multi disciplinary approach to management can lead to prevention of chronic complications associated with spinal injury (5).

Clinical history:

M.N S., a 4 years old boy living in Al_Diwaniya to a family of an intermediate socioeconomic state. He had no history of any significant medical condition. On the 20th of October 2011, while playing in an open field, he stumbled and fall on his face, an accident which led to the entrance of a long thin pin (possibly from a bicycle wheel) through his mouth but with no exit. The patient was referred to surgical subspecialty hospital and was admitted to the facio-maxillary department on the same day. On admission he was fully conscious, oriented and had no neurological deficit, there was a pin entering the oral cavity through it>s right upper part and penetrating the soft palate, there was no exit but the

posterior end was palpable in the right posterior aspect of the neck at the level of C3.

Investigation:

Plain x-ray, AP and lateral views was done, it shows a radio opaque foreign body transverse the oral cavity, pending through the base of skull and cervical canal. As shown in figures (1) ,(2).



Figure(1)

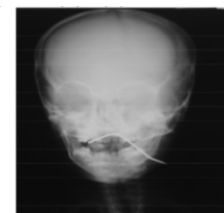
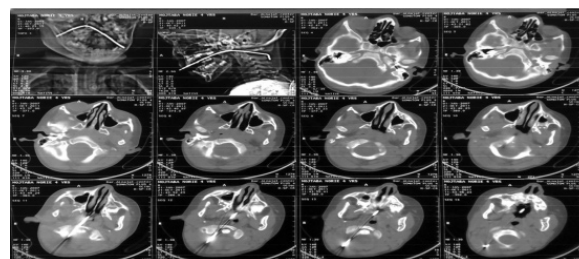


Figure (2)

A CT scan was arranged and it showed the pin entering through the oral cavity, crossing C1 through both anterior and posterior arch of the right side (just between the cervical cord and the right vertebral artery). And ending slightly posterior and to the right of C2. As shown in figure (3).



Figure(3)

Surgery:

He was admitted to the neurosurgical department on the 23rd of October, where full pre-operative preparation was done, Induction of anesthesia and successful endotracheal intubation has been done. Under G.A with the patient in a full lateral-position; through a right posterior lateral neck approach (just

* Department of Neurosurgical / Medical City.

above the palpable curved posterior end) surgical pulling of the pin was done on 24th of October. The pulling was done through its long axis of entrance very gently and by holding the pin superiorly and inferiorly to avoid the possible transverse spring effect of the metallic pin, to reduce any damage to the vital organs and vessels. As shown in figure (4), (5), (6).



Figure (4)



Figure (5)



Figure (6)

Post-operative x-rays

As shown in the figures (7), (8).

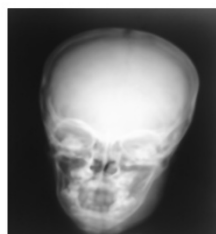


Figure (7)

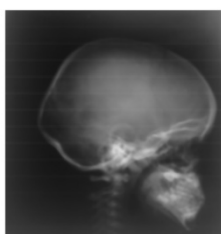


Figure (8)

Discussion

Trans-oral foreign body penetration is a rare accident, Ten cases only reported in the literatures throughout the last three decades (6,7,8,9,10,11,12,13,14,15). In the age group ≤ 9 years, 67% of cervical spine injuries occur in the upper 3 segments of the cervical spine (2, 16). The major causes of death in the spine cord injury (SCI) are aspiration and shock (17). The initial management survey carried under ATLS protocol; (A.B.C»S»); (Air way, breath, circulation), then neurological examination. Careful handling of the patient with cervical stabilization (cervical collar) and maintains an open air way with oxygenation, I.V. lines are mandatory. Examination was the first step in the diagnosis of our patient, as the penetrating object seeing through the oral cavity penetrating the pharyngeal wall and its posterior end palpable in the right lateral aspect of the neck almost at the level of C3 spine and it was slightly tender. Plain x-ray (Ap. & lat. Views) was the second step in the diagnosis of our patient, it showed the passage of the penetrating pin. On the presence of long penetrating pin we avoid antoid view and flexion-extension radiographs, as they are painful to the patient, risky, and may aggravated the neurological state and this was in agreement with others studies (6, 8, 10, 11, 12, 13), but was in disagreement with others studies (18, 19). CT scan of cervical spine and base of skull with bone study was the 3rd step in our evaluation of the patient condition. Although MRI is superior to CT scan to evaluate the possibility of soft tissue injury (20) but it is contraindicated in the presence of metal object. Controversy about the approach, as the decision to pull the pin anteriorly through the oral cavity is so risky; as its posterior

end was curved which may injured vital tissue and vessels during its removal. Cutting the oral piece of the pin to make the pin shorter again it is risky due to its sharp anterior end.

According to the clinical situation; an easy excess to the foreign body its removal should not aggravated the neurological condition, should make less damage through avoiding vital organs and tissue. Some surgeons choose the anterior approach (8, 11, 12); but we didn't use it; as it means more extensive and deeper dissection through the oral and pharyngeal tissues to the cervical regions and if we put in mind the hooked, binding posterior end (as it showed on radiographs films), we can imagine the damage and the risk we expose the patient to. Other surgeons prefer the posterior approach specially if they are planning for fixation of cervical vertebrate (6). Although the posterior approach is easier as it more in use in neurosurgery, But we didn't use this approach in our case as the posterior penetrating end was in lateral aspect of the vertebrae and we have no plan for fixation in the case. Finally we choose the lateral approach for removal of the foreign body in this particular patient, and this in agreement with other studies (13, 14, and 15). Smooth recovery and no morbidity were noticed during the fellow up period; which is extending for three months.

References:

1. Manson D O, Saletta J D, Freeark R J, Carotid vertebral trauma, *J Trauma* 1969, vol. 9, pp.987-9.
2. Perry M O, *Injuries of brachiocephalic vessels, Invasive surgery, Ruther Ford R B(ed.), W B Saunders, Philadelphia, 4th ed. 1995, vol. 1, chapter 47; pp.705-13.*
3. Mark S Greenberg, *pediatric spine injuries; handbook of neurosurgery 2006(6ed) pp.700.*
4. Hamilton M G, Myles S T, *pediatric spinal injuries; review of 61 deaths, J. neurosurgery 1992, vol. 77, pp. 705-8.*
5. B B shnu, N J Ismail; *practical management of spinal cord injury; annals of African medicine, 2004, vol. 3, no. 1, pp.46-52.*
6. C K Salvino, T C originto, D J Dries, J F shea, M springhorn, C J Miller, *Trans-oral crossbow injury; an unusual case of central nervous system foreign body. Journal of trauma, sep. 2004, vol. 57, issue 3, pp.653-655, case report.*
7. A.gutierrez, L.gil, J. sahuquillo, E.rubio, *unusual penetrating craniocerebral injury, surgical neurology, June 1983, vol. 19, issue 6, pp.541-543.*
8. Bartholomew, Bradley J. , Poole, Charla B S, Tayag, Emilio C; *unusual trans-oral penetrating injury of foramen magnum; case report. Neurosurgery oct. 2003, vol. 53, issue 4, pp.9989-991.*
9. Alex mathues, Arun Nair, Shantanu Tomdon, Ophelia D Souza; *Journal of forensic science society; July 1986, vol. 26, issue 4, pp.281-291.*
10. Yingti, Michael P Glotzbecker, Daniel Hedequist, Susant T Mahan, *pediatric spinal trauma; SAGE Journal online, trauma, 2011 sept. 19.*
11. Satoshi Yamaguki, Kuniki Eguehi., ET...al. *penetrating injury of the upper cervical spine by a chopstick-case report in*

- neuralgia medicochirurgica, 2007. Jul; 47(7):328-30.*
12. Hecimovic I, vrankovic D, Rubin O, ET...al. *trans-oral missile removal from anterior C1 region following transpharyngeal missile wound. Arch orthop. Trauma surg. 1999. 199(5-6):340-3.*
13. Deepak Kumar, Singh M., Amit Gupta, R, ET...al. *penetrating injury to cervical spine from a nail gun. Indian journal of neurotrauma. 2009.*
14. Nathoo N, Sarker A, Karma G, Mendel E. *Nail-gun injury of the cervical spine: simple technique for removal of J. Neurosurgery spine. 2011, Jul. 12(1):60-3.*
15. Sossaka Y, Kamada K, ET...al. *penetrating injury of the head, neck and chest by a nail-gun: case report. Pub. Med. Gov. 1995 Dec. 23(12) 1099-104.*
16. Hamilton M G, Myles S T, *Pediatric spinal injury ; review of 174 hospital admissions ,J neurosurgery 1992 , vol. 77 ,pp 700-4 .*
17. Chesnut R M, *Emergency management of spinal cord injury ; neurotrauma ; narayan R K wilberger J E and povlishock J T (ed.) ,McGraw hill ,new York ,1996 , pp1121-38.*
18. Jerry Raphael Dwek ,Christine B Chung ; *radiography of cervical spine injury in children ;A J R June 2000 , vol. 174 ,no 6 ,pp 1617-1619 .*
19. Mac Donald R L , Schwartz M L , Mirich D , Sharkey P W , Nelson W R ; *Diagnosis of cervical spine injury in motor vehicle crash victims; J Trauma ,1990 ,apr.30 ,no 4 ,pp392-7 .*
20. Edward C, Blaine L, ET...al; *magnetic resonance imaging for evaluation of patients with occult cervical spine injury; Journal of neurosurgery, nova. 1996, vol. 85, pp 824-29.*