Thyroid gland rupture after blunt neck trauma: A case report and review of the literature

Sebastian Arana-Garza a, *, Marco Juarez-Parra a, Jeronimo Monterrubio-Rodríguez a, Enrique Cedillo-Alemán a, David Orozco-Agüet a, Zaire Zamudio-Vázquez b, Tanya Garza-Jasso a

a Department of General Surgery, Hospital Christus Muguerza Alta Especialidad, Av. Hidalgo No. 2525 Poniente, Colonia Obispado, Monterrey, Nuevo León, Mexico
b Department of Pathology, Hospital Christus Muguerza Alta Especialidad, Av. Hidalgo No. 2525 Poniente, Colonia Obispado, Monterrey, Nuevo León, Mexico

INTRODUCTION: Soft tissue injuries are relatively common after blunt neck trauma, because of its complex anatomy, many vital structures can be compromised. Isolated trauma to the thyroid is highly uncommon and there are few cases reported in the literature.

PRESENTATION OF CASE: A 19-year-old female patient with no known pathologies who sustained direct blunt trauma to the right frontal half of the neck after falling down from a stair case. She arrived at the ER with moderate neck swelling and pain. There were no visible hematomas and no respiratory compromise was noted. Contrast enhanced CT-scan showed rupture and hematoma of the right thyroid lobe; she underwent surgical exploration with hemi thyroidectomy and recovered uneventfully.

DISCUSSION: Despite soft tissue injuries are relatively common after blunt neck trauma, isolated thyroid gland injury is extremely rare and is present in about 1–2% of the cases and in most of the cases there is an underlining pathology within the gland. Most patients arrived at the emergency room hemodynamically stable, presenting neck swelling, pain, respiratory distress, dysphagia and hoarseness. Diagnosis strategy should be focused to rule out respiratory or vascular compromise. Surgical exploration remains the most common treatment strategy.

CONCLUSIONS: Although the rarity of this condition, physicians should take in mind the possibility of thyroid injury after blunt neck trauma. Early detection and prompt treatment, can reduce life threatening complications. Management should be individualized to patient’s characteristics and surgeon’s experience.

© 2015 The Authors. Published by Elsevier Ltd. on behalf of Surgical Associates Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

Blunt neck trauma is uncommon [1]. When in neutral position, the neck is protected by the head, the shoulders and the chest; hyperextension, hyper flexion, deceleration, rotation and direct blow may contribute to dull trauma to the neck [2,3]. This is why most blunt neck traumas occur during motor vehicle collisions, direct blows, sport activities or strangulation.

Due to its complex anatomy, many vital structures can be compromised such as the larynx, trachea, pharynx, esophagus, major blood vessels and the spine [4]; their close proximity to the skin’s surface makes them vulnerable to injury. Isolated trauma to the thyroid gland in this context is very uncommon. We present the case of healthy female who sustained thyroid gland rupture after falling down from a staircase.

2. Presentation of case

A 19-year-old otherwise healthy woman sustained blunt neck trauma after falling down from a stair case (concrete, sharp edge) at an approximate height of five meters. She arrived at the emergency department 8 h after the event on account of increasing swelling and palpable mass on the right frontal side of her neck.
On arrival she was awake, comfortable and speaking without hoarseness, she complained of difficulty swallowing and persistent pain on the right side of her neck. No dyspnea or stridor was present. She had no previous history of goiter, thyroid masses or thyroid disease.

Her vital signs were normal. Head and neck examination revealed moderate swelling of the right neck that was firm, non-fluctuant, non-pulsating and tender on palpation (Fig. 1). No abrasions or bruises were observed and no subcutaneous emphysema was palpable. Bilateral carotid pulses were normal and there was no jugular congestion, no bruits were auscultated. The rest of her physical examination was within normal parameters as well.

Blood test including thyroid function tests were within normal parameters. Considering the absence of respiratory distress or hemodynamic compromise a contrast enhanced CT-scan was order. An antero-posterior laceration of the right thyroid lobe with adjacent hematoma measuring 3.1 × 4.3 × 4.6 cm was found. Contrast media extravasation to the surrounding tissues could not be assessed (Fig. 2).

Surgical exploration was planned; the patient was brought to the operating room and general anesthesia was induced. Neck exploration with a 6 cm Kocher incision was performed. An intraglandular and periglandular hematoma with parenchymal disruption on the right thyroid lobe was found. Active bleeding from superior thyroid artery was detected after drainage of the hematoma (Figs. 3 and 4). In view of the extensive trauma, right hemi-thyroidectomy was considered necessary and thereafter performed. The entire operation went uneventfully and the patient was then transferred to the regular ward for recovery.

The post-operative course presented no further complications and the patient was discharged on PO day 3. Final histopathology report showed no underlying pathology on the specimen. The patient presented transitory dysphonia that was successfully treated with conservative management; flexible nasolaryngoscopy at 2 weeks post-op revealed no alterations. Follow-up visits were at 1, 6, 12 months postoperatively, thyroid function tests were drawn on every visit, she remained euthyroid throughout her recovery.

3. Discussion

Soft tissue injuries are relatively common after blunt neck trauma [5,6]. Direct impact to the anterior neck has been associated with vascular, bony, muscular, laryngeal, tracheal and esophageal injury [2,5]. Isolated thyroid gland injury is extremely rare and is present in about 1–2% of the cases [7]. The first fatal case of thyroid injury due to blunt neck trauma was described by Simon in 1894 [8]; since then, few cases have been published on this topic.

Early reports occurred in goitrous glands [9] which in addition to the rich vascular supply of the thyroid [2], translates to increased gland size and vascularity or the absence of a true capsule therefore elevating the risk for hemorrhage [10,11]. Nevertheless most of recently published cases occurred in otherwise healthy individuals.

A variety of mechanisms have been described including: direct impact to automobile steering wheels or security airbags, bicycle and motorcycle handle bars, and direct blow to the neck while...
Every patient that sustained blunt neck trauma should be assessed and stabilized according to the ATLS® principles. Injury to vital structures such as the aero digestive tract, major neck blood vessels and spine should be ruled out first. On the secondary survey, although rare, isolated injury to the thyroid gland should be considered as a possibility especially if neck swelling is noted. Further evaluation with a contrast enhanced CT-scan is recommended in order to define which patient requires surgery or which can be left to observation.

Conflict of interest

All authors declare nothing to disclose.

Funding

Nothing to declare.

Ethical approval

This case received approval by the research and ethics board of Christus Muguerza Hospital.

Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Author contribution

All authors have made substantial contributions as following: sa and mj conceived of the report, drafted the manuscript and designed the proposed algorithm. JM, EC, TG and DO made a review and critical analysis of the published literature. ZZ was responsible of the pathology analysis and image collection. all authors read and approved the final manuscript.

Guarantor

Sebastian Arana-garza M.D.

Marco Juárez-parra M.D.

References

[1] J. Ahrens, B. Jüttner, S. Heidt, M. Przemeck, Thyroid gland rupture: a rare case of respiratory distress, J. Emerg. Med. 43 (1) (2012) 41–43.
[2] E.E. Schipper, D.R. Kool, T. Wobbes, L.M.G. Geeraedts, Management of thyroid gland hemorrhage after blunt trauma: a case report and review of the literature, Eur. J. Trauma Emerg. Surg. 35 (4) (2009) 587–590.
[3] J. Tintinalli, Tintinalli’s Emergency Medicine, 7th ed., Mc Graw Hill, 2012.
[4] Y.-L. Sow, N.A. Aziz, K.-L. Ng, Thyroid rupture secondary to blunt neck trauma, Am. J. Emergency Medicine 31 (4) (2013) e3–e5, 760.
[5] C.H. Park, Thyroid gland rupture after blunt cervical trauma, J. Ultrasound Med. 25 (7) (2006) 943–946.
[6] F.J. Fontán, M. Pérez, S.P.V.M.L. Santos Hernández Novoa, Thyroid gland rupture after blunt neck trauma, J. Ultrasound Med. 20 (11) (2001) 1249–1251.
[7] S. Delikouchous, F. Manzos, Thyroid storm induced by blunt thyroid gland trauma, Am. Surg. 73 (12) (2007) 1247–1249.
[8] O. Heizmann, R. Schmid, D. Oertli, Blunt injury to the thyroid gland: proposed classification and treatment algorithm, J. Trauma 61 (4) (2006) 1012–1015.
[9] T. Von Ahnen, M. Von Wirth, et al., Traumatic thyroid rupture: case report and review of the literature, Wien. Med. Wochenschr. 164 (11–12) (2014) 239–244.
[10] M. Blaivas, D.B. Hom, J.G. Younger, Thyroid gland hematoma after blunt cervical trauma, Am. J. Emerg. Med. 17 (4) (1999) 348–350.
[11] B. Saylam, B. Comçali, M. Vasfi, F.C. Ozer, Thyroid gland hematoma after blunt neck trauma, West J. Emerg. Med. 10 (4) (2009) 247–249.
[12] C. Weeks, F.D. Moore, S.J. Ferzoco, G.J. Blunt, Trauma to the thyroid: a case report, Am. Surg. 71 (6) (2005) 518–521.
[13] F. Zawawi, R. Varshney, R.J. Payne, J.J. Manoukian, Thyroid gland rupture: a rare finding after a blunt neck trauma, Int J. Pediatr. Otorhinolaryngol. 77 (5) (2013) 863–865.
[14] American College of Surgeons, 9th ed., Advanced Trauma Life Support Student Course Manual, 2012.
[15] K.-C. Hsieh, F.-F. Chou, C.-H. Lee, Nonsurgical treatment of thyroid injury after blunt neck trauma, Am. J. Emerg. Med. 18 (6) (2000) 739–741.
[16] G. Donatini, Persistent dyspnea following thyroid hematoma after neck blunt trauma, Updates Surg. 64 (1) (2012) 69–71.