CASE REPORT – OPEN ACCESS

International Journal of Surgery Case Reports 12 (2015) 44–47

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

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

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ARTICLE INFO

Article history:
Received 13 February 2015
Received in revised form 27 March 2015
Accepted 13 April 2015
Available online 16 April 2015

Keywords:
Blunt neck trauma
Thyroid gland injury
Thyroid gland rupture

ABSTRACT

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.

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 suffered 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 staircase (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.

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http://dx.doi.org/10.1016/j.ijscr.2015.04.020

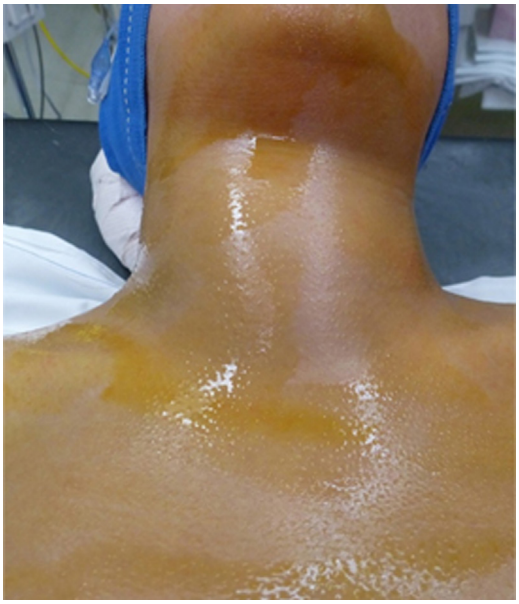

Fig. 1. Swollen neck on patient's presentation.

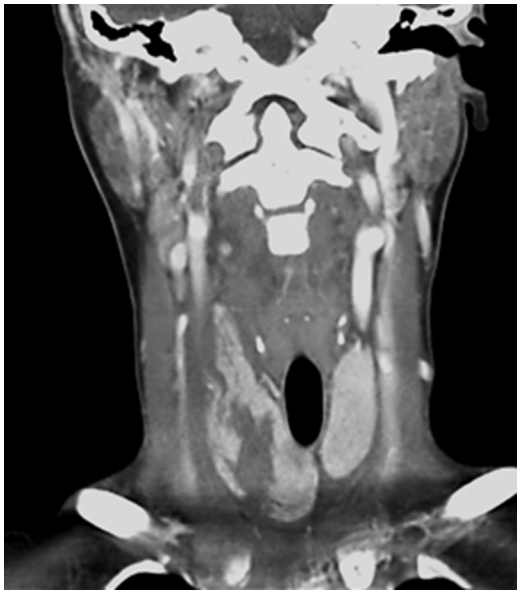

Fig. 2. CT scan demonstrating parenchymal rupture and hematoma of the right lobe.

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 and adjacent hematoma measuring $3.1 \times 4.3 \times 4.6$ 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.

Fig. 3. Intracapsular hematoma on the right thyroid lobe.

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