Arterial Bleeding of a Thyroid Mass After Thyroid Fine-Needle Aspiration Biopsy: A Case Report

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Thyroid fine needle aspiration biopsy is a very common procedure that is used to assess thyroid nodules; any complications from this procedure are rather rare. We report here on an unusual case of active bleeding with the formation of a large hematoma from a branch of the superior thyroidal artery, and this was caused by a thyroid fine needle aspiration biopsy. To the best of our knowledge, this is the first report of active arterial bleeding after thyroid fine needle aspiration biopsy. The active bleeding was successfully treated by interventional embolization.

Index words: Thyroid gland
Biopsy, fine-needle
Hematoma

Fine-needle aspiration biopsy (FNAB) is widely used for the diagnostic work up of thyroid nodules [1]. It has proven to be a safe, reliable and effective tool over many years [2, 3]. FNAB of the thyroid gland sometimes causes a hematoma; this is the most commonly encountered complication [4]. Most hematomas that occur after a FNAB are self-limiting, they cause only minimal pain and some times they cause mild neck swelling. There have been several reported cases of massive intrathyroidal hemorrhage that produced acute airway compromise after FNAB [5, 6]. However, a massive intrathyroidal hemorrhage produced by active arterial bleeding after a FNAB and the subsequent interventional embolization of the bleeding focus has not been previously reported. We present here on a case with active arterial bleeding of the thyroid gland after a FNAB and this required interventional embolization.

Case Report

A 74-year-old man was referred to the department of radiology for fine needle aspiration biopsy of a thyroid mass. A 3.62 × 1.73 cm heterogeneous echoic solid mass with calcifications was incidentally detected on the right side of the thyroid gland on a previously performed carotid doppler ultrasonography exam (USG) (Fig. 1A). An USG guided FNAB of the right thyroid mass was performed by an interventional radiologist. First, the patient was placed in the supine position with a rolled towel behind the back to extend the neck. The mass was localized in the transverse plane, and the freehand biopsy technique was used. The needle was inserted by the short axis ap...
Fig. 1. A. Transverse sonogram of the right lobe of the thyroid demonstrates a heterogeneous echoic solid mass (white arrows) with macrocalcification and posterior shadowing.
B. The echogenic tip of a 23 gauge needle is shown within the mass (white arrow)
C. Transverse sonogram of the right lobe of the thyroid immediately after the fine needle aspiration biopsy shows a large heterogeneous echoic hematoma (white arrows) in and around the thyroid gland.
D. Axial contrast enhanced CT reveals active arterial bleeding (black arrow) within the right thyroid mass (white arrows) and a large hematoma (open arrow) around the thyroid gland.
E. Selective right superior thyroid arteriography demonstrates extravasation of contrast material in the right lower neck from a small branch of the right superior thyroid artery (white arrow).
F. After gelfoam embolization, there is complete occlusion of the right superior thyroid artery and extravasation of the contrast material is no longer visible.
approach, and the tip was seen as a bright echogenic focus on USG [Fig. 1B]. Next, the needle tip was gently advanced into the mass in various positions and several to-and-fro motions were performed within the mass along with concurrent aspiration. Approximately 2 mL of bloody aspirate was obtained using this technique. This procedure was performed one time and the needle was immediately withdrawn. Acute diffuse neck swelling immediately developed when the needle was removed from thyroid mass. Compression of the neck with the USG probe was performed for about five minutes, but the diffuse neck swelling progressed and a diffuse hematoma was detected in and around the right thyroid mass on USG [Fig. 1C]. One hour after the FNAB was performed, a neck CT revealed active bleeding of the right thyroid mass with a diffuse hematoma around
both lobes of the thyroid gland (Fig. 1D). The patient was then transferred to the intervention room. A selective right superior thyroid arteriogram was performed by an interventional radiologist. Active bleeding was detected from a small branch of the right superior thyroid artery (Fig. 1E). Embolization of the active bleeding from the artery was performed with using gelfoam and no further extravasation of contrast material was seen (Fig. 1F).

About 12 hours after the procedure, the patient developed severe dyspnea and so emergency endotracheal intubation was carried out. A second neck CT showed an increased size of the hematoma and tracheal deviation that was caused by the hematoma; however, there was no obvious active bleeding focus found on the CT (Fig. 1G). A review of the clinical history of the patient revealed that the patient had a bleeding tendency due to warfarin treatment; the anticoagulant was being taken by the patient to prevent a cerebral infarction. The hematoma examination revealed a prothrombin time of 18.3 sec (normal range: 9.5–13 sec), an international normalized ratio of 1.90 (normal range: 0.7–1.6), an active partial thromboplastin time of 48.1 sec (normal range: 24–43.5 sec), a hemoglobin level of 12.0 g/dL (normal range: 13–17 g/dL), a hematocrit of 33.6% (normal range: 39–51%) and a platelet count of 163,000/mm³ (normal range: 150,000–450,000) at that time of the FNAB. Discontinuation of the patient’s anticoagulant agent was recommended by the lead clinician. The hematoma and dyspnea persisted; five days later the CT revealed confined dense contrast material within the thyroid nodule and this was surrounded by a diffuse hematoma, which was suggestive of a pseudoaneurysm (Fig. 1H). A second angiography was performed; the selective superior thyroid arteriography showed recanalization of the right superior thyroid artery and confined extravasation of contrast material from the same small branch that was seen on the first angiography in the right lower neck (Fig. 1I). A second embolization procedure with using microcoils (Vortex, Boston Scientific, Cork, Ireland) and gelfoam was successfully performed (Fig. 1J). The follow up CT showed no more active bleeding and a decreased size of the hematoma in the right thyroid gland.

Discussion

FNAB is an effective, proven technique that is used to evaluate thyroid nodules; it has a high diagnostic yield with minimal discomfort and side effects (1). FNAB of the thyroid gland has low morbidity; hematomas are the most commonly encountered complication (4). It is likely that small hematomas that occur after a thyroid FNAB are usually asymptomatic and they resolve completely (7). In some cases, patients have pain or dyspnea due to a subcapsular hematoma or diffuse hemorrhage of the thyroid gland after FNAB. Thyroid nodules have numerous aberrant vessels that are relatively thin-walled, and these are susceptible to rupture in the tissue planes that run between the nodules and the surrounding thyroid lobules. The penetrating trauma caused by the FNAB can cause rupture of these thin, weakened vessels in thyroid nodules; these vessels are mostly veins. Because the hemorrhage and hematoma are easily detected on USG during the FNAB or the next day after the FNAB, most patients are discharged after compression of the hematoma for several minutes, and some cases require additional pain control. Massive intra-thyroid hemorrhage after a FNAB is extremely rare. Several such cases have been reported to show obstruction of the airway due to massive hemorrhage or hematoma formation after FNAB (5, 6). However, there are no prior reports of active arterial bleeding and a rapidly expanding hematoma secondary to a thyroid FNAB, and this all caused a mass effect.

Generally, the use of anticoagulants or salicylates does not preclude performing a FNAB of a thyroid nodule (8). However, Kien-Fong et al reported that bleeding events after endoscopic USG guided FNAB and/or trucut biopsy were increased in patients who were taking prophylactic low molecular weight heparin (9). In addition, Hor et al reported a case of large bilateral thyroid hematomas after routine fine-needle aspiration, and the hematomas caused acute airway obstruction in a patient with hypertension and end stage renal disease, and the patient had been taking aspirin (10). However, for a FNAB of the thyroid gland, the patient’s use of anti thrombotic agents or anticoagulants must be assessed to determine an adequate period to withdrawal the offending drug, and the possible morbidity and mortality associated with these medications and this procedure.

In conclusion, thyroid FNAB is a widely used, useful and relatively safe procedure. However, the hematological profiles, including the prothrombin time, the active partial thromboplastin time and the platelet counts, and a history of taking anticoagulants or anti thrombotic agents should be investigated before performing a FNAB. The FNAB should be delayed until the patient...
discontinues these drugs due to the potential risk of unexpected acute arterial bleeding and the formation of a large hematoma.

References

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