Management of Spontaneous Neck Hematoma in Patients on Anticoagulant Therapy: Our Experience from a Tertiary Care Center

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Abstract Spontaneous neck hematoma is a rare but life threatening condition which poses a challenge in clinical decision making. With the unsupervised outpatient use of oral anticoagulants, including newer generation ones and the thromboprophylaxis in Covid-19 treatment protocol, the risk of developing spontaneous neck hematoma is high. In this context, our case series aimed at studying the clinicopathological profile, treatment options and outcome in patients presented with spontaneous neck hematoma in a tertiary care center. A retrospective chart review was done between the years 2010–2021, and three cases of spontaneous neck hematoma associated with anticoagulation therapy were identified. Based on our experience, we recommend a custom tailored approach to management of spontaneous neck hematoma.

Keywords Spontaneous neck hematoma • Anticoagulation • Thromboprophylaxis • Cervical hematoma • Airway

Management of Spontaneous Neck Hematoma in patients on Anticoagulant therapy – Our Experience from a Tertiary Care Center

Spontaneous cervical hematomas and hemorrhages are unusual, but is a life threatening clinical condition. The literature concerning this topic is sparse with only few case reports published so far [1]. Aneurysm, infection, rupture and bleeding of thyroid and parathyroid tumors, and an underlying coagulopathy are reported as the etiologies for spontaneous neck hematoma [1, 2]. The characteristic symptoms of neck hematoma are esophageal and tracheal compression, tracheal displacement, and successive emergence of subcutaneous ecchymosis. These triad of symptoms are first reported by Capp’s et al. and termed as the Capp’s triad [1–3]. Other clinical presentations include tongue falling back and upper airway compromise, dysphagia, hoarseness, and neck pain. [1, 2]. The severity of these clinical presentations ranges from self-limited bleeding to significant compromise of airway and surrounding neuro-vascular structures.

We have done a systematic search on neck hematoma in patients with anticoagulant therapy in PubMed and EMBASE for case reports, case series, and related articles and we could identify only 39 cases from 35 reports, between the years 1950–2020. Hence we are presenting our experience along with a literature review in managing spontaneous neck hematoma in patients on anticoagulation. A retrospective chart review was done from the year 2010–2021, and three cases of spontaneous neck hematoma associated with anticoagulation therapy were identified.

One of our patients was Covid-19 positive and was receiving a newer generation anticoagulant, Rivaroxaban, for Covid-19 thromboprophylaxis [4]. To our knowledge, this is the first case report of spontaneous neck hematoma.
in a Covid-19 patient who was on thromboprophylaxis. Other patients were receiving Warfarin as an anticoagulant after mechanical valve replacements. Bleeding, internal or external, remains the major problem with anticoagulant therapy. The risk is significantly high with INR levels above 4.5 [5].

Case–1

76 year old male who is a known case of atrial fibrillation, coronary heart disease with history of cardioembolic cerebrovascular accident 2 years back, who was on Ecosprin, Clopidogrel and Acitrom was referred to our emergency department with complaints of sudden onset, spontaneous oral bleed and swelling in the floor of mouth.

10 days before the incident, patient was admitted for Covid-19 treatment and was discharged with Apixaban 5 mg twice daily along with his regular Ecosprin 150 mg once daily, Clopidogrel 75 mg once daily and Acitrom 5 mg twice daily considering post Covid hypercoagulable state.

He also has a history of swelling at the floor of the mouth since childhood which was suspected to be hemangioma, for which no evaluation or treatment was taken. A clinical diagnosis of spontaneous rupture of sublingual hemangioma was reached.

On examination, his vitals were stable–pulse 112 beats per minute, BP was 176/100 mm Hg, SpO2 was 98% with oxygen at 2L/Min via nasal mask. Oral cavity was blood stained (Fig. 1), with hematoma and blood clots in the floor of the mouth, pushing the tongue posterior, and completely obscuring the view of the soft palate (Mallampati 4). A suprahyoid tense neck swelling was present in the midline. No audible stridor or stertor was present.

At the presentation, his blood investigations were unremarkable for inflammatory markers. Hemoglobin was 13.4 mg/dl, and platelet count was 4.32 lakhs. His coagulation profiles were altered with PT-INR values more than 9. All other biochemical profiles were within normal limits.

Since he was maintaining his vitals, with no stridor, he was put on conservative management in the Intensive Care Unit (ICU) with an option of flexible awake intubation / emergency tracheostomy as standby. His anticoagulants were withheld, Packed cells (PC), fresh frozen plasma (FFP) and Vit K injections along with antibiotic coverage were administered.

His clinical condition was improving with the conservative management and he was continued monitoring in the ICU. Hematoma started resolving and tongue position returned back to normal with Mallampati grade 1 by the third day. On day 5, he was transferred to the cardiology unit to restart his anticoagulants. He was discharged on day 6 with Ecosprin 150 mg and Acitrom 1 mg once daily and is on follow-up with monitoring of PT-INR. He is due for definitive management of sublingual hemangioma.

Case–2

A 66 year old male, who underwent aortic valve replacement 4 years back and was on unsupervised warfarin therapy presented to the emergency department with 2 days of history of sudden onset painful anterior neck swelling. He was having difficulty in swallowing, opening the mouth, change in voice and dysphagia.

On initial evaluation, he was afebrile, his vitals were stable, oxygen saturation was 96% on room air, heart rate was 118 beats/min and blood pressure was 118/76 mm Hg. Examination of the oral cavity revealed hematomas in the floor of the mouth with the tongue pushed back completely obscuring the oropharynx. There was a diffuse, warm, tender swelling in the anterior neck, extending from the

Fig. 1 Oral cavity findings in patient–1. A Oral cavity stained with blood, tongue pushed upwards and backwards with hematoma in the floor of mouth. B Patient at time of discharge with echymosis in floor of mouth. C Patient on first follow up after 14 days.* sign shows the hemangioma in left lateral border of tongue

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level of the mandible to the clavicle on the right side. Audible stridor was present at rest.

His blood investigations were unremarkable for inflammatory markers. Hemoglobin was 10.3 gm/dl, Serum Calcium was 9.2 mg/dl. His coagulation profiles were altered with PT-INR values more than 6. Liver function, renal function and thyroid functions were within normal ranges.

A contrast enhanced CT scan of the neck revealed a hyperdense area in the base of the tongue, extending to the right submandibular and sublingual space (Fig. 2). Fat stranding and effacement of the valleculae and right piri-form sinus are noted. There was no contrast blush.

To secure the airway, he was taken for Awake Flexible Fiberoptic Intubation with a standby tracheostomy. On fiberoptic endoscopy, submucosal hematoma was visualized in the base of the tongue, vallecula, extending to the epiglottis, aryepiglottic fold, almost obscuring the laryngeal inlet. With difficulty in visualizing the cords, the senior anesthetist was able to intubate the patient and the airway was secured.

In view of the clinical diagnosis of neck hematoma, his anticoagulation therapy was withheld. To correct his coagulopathy, IV antibiotics and anti-inflammatory medications were administered and the patient was put on mechanical ventilation. His hemoglobin values and PT-INR values were serially monitored and are tabulated below—Table 1.

He remained in a stable condition in the ICU and later returned to the ENT department. He was discharged on the tenth day of hospitalization, with stable signs and marked improvement of symptoms, and size of the hematoma. Need for supervision of anticoagulant therapy was explained to the patient and the caretakers.

Case–3

A 75 year old diabetic, hypertensive female presented to the emergency department with sudden onset odynophagia for both solids and liquids of 3 days duration. She gives a history of cardioembolic cerebrovascular accident 2 years back and is on unsupervised Warfarin 5 mg once daily therapy along with Ecosprin 150 mg.

On examination, she was afebrile, there was swelling in the floor of the mouth with elevation of the tongue posteriorly. Poor oro-dental hygiene was noted. There was ecchymosis and tenderness in the anterior neck. Vitals were stable, oxygen saturation was 96% on room air. Pulse rate was 92/min and blood pressure was 160/100 mm of Hg. Coagulation profile was deranged with PT INR more than 6..Blood counts and inflammatory markers were normal.

A contrast enhanced CT scan of the neck revealed a hyperdense area in the base of the tongue, extending to the right submandibular, sublingual space and preepiglottic space. There was no contrast blush. Hence, a diagnosis of neck hematoma was made.

In view of patient maintaining oxygen saturation at 96% with 2 L oxygen through face mask with no tachypnoea, a wait and watch policy was adopted along with correction of drug induced coagulopathy with transfusion of fresh frozen plasma and platelet. Patient showed improvement the next day with reduction in the size of swelling and pain in the neck. On day 3, patient could be completely weaned off oxygen and fiberoptic laryngoscopy showed blackish discoloration of mucosa of base of tongue and valleculae with no airway compromise. She was restarted on T.Warfarin 2 mg at time of discharge and is on regular follow-up with INR reports.

Discussion

Spontaneous neck hematoma devoid of any comorbidity is a rare but acute airway emergency. The patient must be assessed rapidly and decisions should be made. In the absence of compromised airway or hemodynamic instability, cases have been successfully treated conservatively [6].

The dreaded complication of neck hematoma is airway compromise [7]. With stridor, neck swelling, and the patient’s dyspnea and agitation, airway securing will be difficult. Direct laryngoscopy in the presence of pathological hindrance may also be tricky as anatomic landmarks become distorted, displaced, or obscured. Cricothyrotomy or tracheostomy by percutaneous or open surgical routes may also be difficult as landmarks are shifted or become indistinct [7]. In addition to airway

Fig. 2 Contrast CT imaging of patient–2, axial sections. A At the level of hyoid bone. B At the level of thyroid cartilage

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obstruction, hypovolemic shock due to blood loss can also
make the situation worse especially when the patient is on
anticoagulants [8].

Though upper neck hematomas are rare with anticoag-
ulant therapy, reports are there in which spontaneous
hematoma occurred even with a bout of violent coughing
[9]. The most common neck haematomas in patients who
were undergoing anticoagulation therapy are laryngeal,
retropharyngeal and sublingual [7].

Warfarin is the most commonly prescribed oral antico-
agulant in patients with cardiac illness [9]. It is associated
with bleeding incidence of 6.8%. Warfarin levels are
monitored with regular INR with a target of 2 to 3 in atrial
fibrillation and venous thromboembolism and 2.5 to 3.5 in
patients with mechanical heart valves. The parallel usage
of antiplatelet drugs such as aspirin and clopidogrel further
increases the risk of bleeding. This risk of bleeding is
related to INR in a log linear manner and is known to be
higher with INR levels > 4.5 [10, 11].

Regarding definitive management of spontaneous neck
hematoma, no consensus exists on the best approach to
treatment in the literature. Cohen and Warman advocate
early tracheotomy in all patients [11], while Rosenbaum
proposes close monitoring in intensive care unit (ICU)
[12]. Genovesi et al. [13] has favored early surgical evac-
uation of the hematoma, but it carries the risk of increasing
airway compromise and soft tissue edema and is not war-
anted. Studies by Hefer et al. [14] and Karmacharya et al.
[9] have shown that there is no difference in outcome
between conservative and aggressive approaches.

In clinical practice, the choice between observation,
intubation, or a surgical airway intervention must rely upon
understanding of the natural course and high rate of airway
occlusion. In mild cases with no airway compromise,
conservative management with reversal of the coagulopa-
thy with packed cells, fresh frozen plasma and vitamin K
preferably in an ICU setting may be sufficient. The rec-
commended dose of FFP and PC is 4 units/kg with INR
greater than 1.5 and 50 units/kg with INR greater than 6,
respectively.

In patients with symptoms of airway compromise, the
airway must be secured prior to complete obstruction. The
preferred management should be fiber-optically-guided
awake endotracheal intubation by a critical care expert
team. Awake tracheostomy or Cricothyrotomy should be
done only in cases where intubation is not possible [9, 12].
Anticoagulation therapy can be restarted once the
hematoma resolves, but regular monitoring of PT-INR is
needed.

**Conclusion**

Spontaneous neck hematoma during anticoagulation ther-
apy is a rare but a life threatening situation that poses a
dilemma in clinical decision making. Our experience and
literature review advises a case tailored approach to the
management of spontaneous neck hematoma.

Many post covid patients are receiving prophylactic
anticoagulation at time of discharge to prevent throm-
boembolic events.

It is prudent to inform the patient regarding the need of
regular follow-up with PT-INR values and early warning
signs of bleeding when they are started on anticoagulants to
avoid such catastrophic events.

**Declarations**

**Conflict of interest** The authors declare that they have no conflict of
interest.

**Ethical Approval** All procedures performed in studies involving
human participants were in accordance with the ethical standards of
the institutional and/or national research committee and with the 1964
Helsinki declaration and its later amendments or comparable ethical
standards.

**Informed Consent** Informed consent was obtained from parents of
all individual participants included in the study.

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