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Short Communication

Venous Thromboembolism Following Thyroid Surgery

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ABSTRACT

Venous thromboembolism is viewed as a serious health care issue. Patients who experience venous thromboembolism often have an detoriorated quality of life after the event that may require anticoagulation. This results to the risks of spontaneous bleeding. Bleeding after thyroid surgery can present acutely and can lead to airway compromise and death if not recognized and treated appropriately. Whether prophylaxis in a low-risk patient puts the patient at a greater risk of developing a bleeding complication is not well documented. The literature is scarce regarding the prevalence of venous thromboembolism following thyroid and parathyroid surgery.

Keywords: Thyroid surgery; Thromboembolism

There are few existing studies on the prevalence of venous thromboembolism (VTE) following thyroid and parathyroid surgery (1). Conversely, risk factors, causes and management of intra- and post-operative bleeding have been extensively detailed in endocrine surgery (2). Furthermore, specific thyroid surgery morbidity are well exposed in the Literature, as recurrent laryngeal nerve, parathyroid gland lesions (1).

Routine drug venous thromboembolic prophylaxis (VTT) is controversial in thyroid surgery because, 1) the rate of VTE following thyroid and parathyroid surgery is lower than that of any other general surgical procedures, and 2) the potential risk postoperative bleeding in the neck area and mortality is considerable (1-8). Few surgeons therefore refrain from using routine VTT and only use if special non-surgical reasons coexist (2).

A recent study was designed to examine the advantages and disadvantages of a VTT based on the Caprini score used in general surgery (1) (**Fig. 1**). In 2011, the Boston Medical Center installed a standardized Caprini score-based VTT program (1). Patients with a low risk of thromboembolism (Caprini score 0–2) received mechanical (intermittent pneumatic compression) or VTT drug. Patients with moderate score (Caprini score 3–4) a mechanical prophylaxis and subcutaneously unfractionated heparin or prophylaxed low molecular weight

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heparin (LMWH). Patients with a high score (Caprini score >5) received mechanical and drug-based VTT on an inpatient basis, and depending on the risk, LMWH was prescribed for 7 to 10 or 30 days postoperatively. All patients received unfractionated heparin preoperatively and 8 hours early postoperatively. The drug regimen could be individually modified by the surgeon if he felt that it was indicated (1). More then 1,000 consecutive patients operated on from 2011 to 2016 were included and evaluated retrospectively. The 72% of the patients had a Caprini score <4, 17 patients (1.7%) a score of >9 (highest risk) (1). Fifteen patients had recurrent bleeding (4 arterial, 6 diffuse, 5 no active source of bleeding), 12 of them within 24 hours postoperatively. Of the 82 patients who had received prolonged VTT, only 1 patient developed re-bleeding, i.e., one of the 15 patients listed above (1). Only 1 patient, who had a Caprini score 10, developed a deep venous thrombosis after 22 days postoperatively (1).

These results suggest that the Caprini score-based VTT concept established in the above-mentioned institution can also be applied to thyroid and parathyroid surgery without an increase in bleeding (1,2). Patients with a low or moderately elevated Caprini score may be excluded from a routine drug regimen, and patients at high risk may be treated for prolonged VTT (1,2). In cases of thyroid and parathyroid surgery, routine drug-based thrombosis prophylaxis is indicated only in non-surgical exceptional cases, but an interdisciplinary list of criteria for this is still missing (2). Dralle et al. (2) well pointed out that whether the Caprini score in clinical practice is equally medically and administratively effective for the endocrine surgical area should show tests with sufficient power before the use of these scores can be recommended.

Each risk factor=1 point

- Age 40–59 years
- Minor surgery planned
- BMI ≥30 kg/m^2
- History of prior major surgery (<1 month)
- Swollen legs (current)
- Varicose veins
- Sepsis (<1 month)
- Abnormal pulmonary function (COPD)
- Acute myocardial infarction (<1 month)
- Congestive heart failure (<1 month)
- History of IBD
- Medical patient currently at bed rest

For women only (1 point each)

- Pregnant of post-partum
- History of unexplained or recurrent spontaneous abortion
- Oral contraceptives or hormone replacement therapy

Each risk factor=2 points

- Age 60–74 years
- Arthroscopic surgery
- Major open surgery (>45 minutes)
- Laparoscopic surgery (>45 minutes)
- Prior cancer (except non-melanoma skin cancer)
- Present cancer (except breast and thyroid)
- Confined to bed (>72 hours)
- Immobilizing plaster cast
- Central venous access

Caprini risk category based on total risk score

Total score	Category
0–4	Low
5–8	Moderate
≥9	High

Each risk factor=3 points

- Age ≥75 years
- History of VTE
- Family history of VTE
- Present chemotherapy
- Positive Factor V Leiden
- Positive Prothrombin 20210A
- Positive Lupus anticoagulant
- Elevated anticardiolipin antibodies
- Elevated serum homocysteine
- HIT
- Other congenital or acquired thrombophilias

Each risk factor=5 points

- Major surgery lasting >6 hours
- Stroke (<1 month)
- Elective major lower extremity arthroplasty
- Hip, pelvis, leg fracture (<1 month)
- Acute spinal cord fracture or paralysis (<1 month)
- Multiple traumas (<1 month)

Fig. 1. Caprini risk assessment model. Caprini score of 10 or greater are considered high risk and a score of less than 10 are considered low risk.
BMI = body mass index; COPD = chronic obstructive pulmonary disease; IBD = inflammatory bowel disease; VTE = venous thromboembolism; HIT = heparin-induced thrombocytopenia.

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