

Importance of Hemostasis at Trendelenburg Position in Order to Prevent Bleedings After Thyroidectomy and Evaluation of 17 Bleeding Among 1650 Thyroidectomies

Tiroidektomi Sonrası Kanamayı Önlemek İçin Trendelenburg Pozisyonunda Hemostazın Önemi ve 1650 Tiroidektomi Arasında 17 Kanamanın Değerlendirilmesi

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ABSTRACT Objective: Although postoperative bleedings after thyroidectomies are very rare, if required attention isn't paid and postoperative patient follow-up is poor, possibly fatal and serious conditions may occur. **Material and Methods:** Records of 1650 patients who underwent thyroidectomy for any reason between the years 2004 and 2009 at general surgery department were examined retrospectively. Patients were considered in terms of age, sex, diagnosis, whether the operation is primary or secondary, treatment, technique of performed surgery, whether drainage was used or not, need for transfusion, result of pathology report, detail of intervention for bleeding, length of hospital stay, existence of other complications, co-existing diseases, off-routine hemostasis control, surgeons of the operations and time of bleeding. **Results:** Seventeen out of 1650 cases had postoperative bleeding, where 12 of the patients were male and 5 were female. Eleven cases had primary and 6 had secondary operations. At 11 cases pathological diagnoses were benign, where 6 had malignancy. Four cases had drains drainage. One of the drains were penrose and the rest had negative pressure (Hemovac). Nine cases had bled from thyroid itself, 4 prethyroidal muscles, 4 from subcutaneous tissue. For 3 cases the bleeding had arterial origin, and it had venous origin for 14 cases. Surgical procedures were total thyroidectomy for 14 cases, and subtotal thyroidectomy for 3 cases. **Conclusion:** In order to avoid bleeding following thyroidectomy, after routine hemostasis during the operation, hemostasis control should be completed with either Valsalva maneuver or bringing the patient to partial Trendelenburg position.

Key Words: Thyroidectomy; thyroidectomy; hemostasis; head-down tilt

ÖZET Amaç: Tiroidektomilerden sonra kanama çok nadir olmasına rağmen postoperatif hastanın takibine gereken önem verilmezse büyük olasılıkla ölümcül ve ciddi durumlar meydana gelebilir. **Gereç ve Yöntemler:** Genel cerrahi kliniğinde 2004-2009 yılları arasında herhangi bir nedenle tiroidektomi ameliyatı yapılan 1650 hastanın kayıtları retrospektif olarak değerlendirildi. Hastalar yaş, cinsiyet, tanı, primer veya sekonder ameliyat, tedavi, uygulanan cerrahi teknik, dren kullanılıp kullanılmadığı, transfüzyon ihtiyacı, patoloji sonuçları, kanamaya müdahale edilen yer, hastanede kalış süresi, diğer komplikasyonların durumu, yandaş hastalıklar, rutin hemostaz kontrolü, ameliyatı yapan cerrahi ekip ve kanamanın zamanı açısından değerlendirildi. **Bulgular:** Hastalarda 1650 vakanın 17'sinde postoperatif kanama görüldü, 12'si erkek ve 5'i kadındı. Vakaların 11'i primer, 6'sında sekonder ameliyattı. Yine 11 vakada patolojik tanı benign, 6'sı malignandı. Toplam 4 hastaya dren konmuştu. Drenlerin birisi penroz, üçü negatif basınçlıydı (hemovac). Dokuz hastada kanama tiroid dokusundan, dördünde tiroid önü kaslardan, dört hastada da cilt altı dokulardandı. Kanamaların üçü arteriyel, on dördü venöz kaynaklıydı. Kanayan olgulardan 14'üne total, 3'üne subtotal tiroidektomi yapılmıştı. **Sonuç:** Tiroidektomiyi takiben kanamadan kaçınmak için, ameliyattan sonra rutin hemostazı takiben Valsalva manevrası veya kısmi Trendelenburg pozisyonunda hemostaz yapılmalıdır.

Anahtar Kelimeler: Tiroidektomi; kanama; kanamanın durması; baş aşağıda yatırmak

Postoperative bleedings from the thyroidectomy bed are on top of the fatal complications after thyroidectomy. Bleedings during thyroidectomy are somehow handled. But if required attention isn't paid for postoperative bleeding and patient followup is poor, possibly fatal and serious conditions may occur.

Bleedings developing after thyroidectomy do not threaten patient's life due to blood loss or, in other words, hypovolemia. Hematoma developing after inconsiderable amount of bleeding presses on larynx and trachea, disrupting breath. Early recognition and evacuation of blood and coagulum prevent patient loss due to respiratory distress.

Aside from bilateral inferior laryngeal nerve dissection which is very rare, there's no complication as emergent as bleedings to thyroid lodge causing respiratory distress. Hemostasis control at special positions such as Valsalva maneuver after the operation may be effective in order to prevent postoperative bleedings.¹ Indeed, we observed that there was no such control at any of 17 bleeding cases. Seventeen cases with postoperative bleeding, out of 1650 thyroidectomy cases performed for the last 5 years, were examined in details.

MATERIAL AND METHODS

Between the years 2004 and 2009 1650 patients had thyroidectomy in our clinics. At 17 cases there was postoperative bleeding, bringing the need for intervention. For these 17 cases patient age, sex, diagnosis, whether the operation is primary or secondary, treatment, technique of performed surgery, whether drainage was used or not, need for transfusion, result of pathology report, detail of in-

tervention for bleeding, length of hospital stay, existence of other complications, co-existing diseases, off-routine hemostasis control, surgeons of the operations and bleeding time after the operation were considered.

Any anticoagulant drug was stopped. Patients with high ASA (American Society of Anesthesiology) scores were excluded. Standard thyroidectomy technique was applied to all cases. Unipolar (15 watt) and bipolar electrocauteries were used when necessary. No special maneuver or position was applied to the patient for hemostasis control. Drainage wasn't used routinely, except some cases. Dressing material was classic. Patients were taken to observation room or ward at postoperative period. Routine follow-up was performed. At bleeding cases with excessive respiratory distress, the wound was opened and the hematoma was evacuated at the ward or operation room. Patients with the need of urgent entubation were entubated at the ward, whereas those who don't need urgent entubation aren't urgent were entubated at the operating room. Hemostasis was succeeded under anesthesia. The wound was closed primarily, without any drainage.

RESULTS

Characteristics of 17 bleeding cases out of 1650 thyroidectomy cases were given at Table 1. Seventeen out of 1650 cases had postoperative bleeding, 12 of the patients were male and 5 were female. Mean age was 46.18 (22-75) years. Eleven cases had primary and 6 had secondary operations. At 11 cases pathological diagnoses were benign, where 6 had malignancy (Table 2). Surgical procedures were to-

TABLE 1: Characteristics of 17 bleeding cases among 1650 thyroidectomy cases.

Characteristics	Postoperative bleeding: 17(1.03%)	
	Primary/Recurrence	Primary: 11
Sex	Male: 12	Female: 5
Type of thyroidectomy	Total: 14	Bilateral Subtotal: 3
Pathological diagnosis	Benign: 11	Malignant: 6
Drain	Penrose: 1	Hemovac: 3
Source of postoperative bleeding	Arterial: 3	Venous: 14
Place of intervention to bleeding	Operating room: 14	Bedside: 3

tal thyroidectomy for 14 cases and subtotal thyroidectomy for 3 cases (Table 3). Four cases had drainage. One of the drains was penrose and the rest were drains with negative pressure (Hemovac). But the drains weren't functioning during the bleedings. Nine cases had bled from thyroid itself, 4 from prethyroidal muscles, 4 from subcutaneous tissue (Table 4). For 3 cases the bleeding had arterial origin, and it had venous origin for 14 cases. At 3 cases with excessive respiratory distress, the wound was opened while the patient was still on his/her ward bed and the hematoma was evacuated. No transfusion was required for any of the patients. Fourteen patients were intubated at the operating room and the bleeding was ended. Four patients had systemic diseases such as chronic renal failure, chronic obstructive pulmonary disease, hypertension and diabetes mellitus.

Mean hospital stay was 5 days. All 17 patients, except two, were intervened within the first 6 hours due to postoperative bleeding. There was no ne-

ed for intubation for 3 patients. Two patients had re-bleeding when they were still on operation table at awakening stage after they were extubated, so they were re-intubated, the wound was opened and the bleeding was controlled.

DISCUSSION

Neck is an anatomical area of fine blood supply. Thyroid gland is one of the two organs with the richest blood supply per unit-weight. For this reason, the gland keeps alive even if the thyroid arteries are ligated. So, even if appropriate hemostasis is performed, there's always a possibility for postoperative bleeding.

One of the ways to prevent postoperative bleeding is performing the surgical procedure neatly and precisely. In addition to this, after routine hemostasis is achieved at the operation the head is placed horizontally and anesthetists are asked to perform hyperventilation (Valsalva maneuver). So the pressure inside the vein is increased. The veins which are open or which have a tendency to open for bleeding are ligated.²

In order to control bleeding after thyroidectomy the patient is first held in semi-Fowler position and brought to partial Trendelenburg position without taking away the cushions under the head and the shoulder at our clinics, for the last three years. The first resident pulls the larynx to himself/herself and the operator performs hemostasis control. There was no need for reoperation at these cases. At 17 cases out of 1650 thyroidectomy cases, there was no bleeding control by changing the position off-routine. As pressure inside veins at the neck increases with both Valsalva maneuver and partial Trendelenburg position, the possibility to recognise venous-originated bleedings during the operation increases.¹ For our cases, 14 out of 17 bleedings were venous. We believe that if hemostasis control had been performed, a majority of the cases would have been prevented.

Drain use after thyroidectomy is usually not preferred. At a previous study of us with drains, we found out that drains (penrose and hemovac) couldn't take out all of the blood at thyroid lodge and results at control group (no drain) were better.^{3,4} At

TABLE 2: Primary pathologies of the patients with postoperative bleeding.

Entity	n	%
Benign thyroid diseases	9	52.94 %
Thyroiditis	2	11.76 %
Malignant thyroid diseases	6	35.30 %
Total	17	100 %

TABLE 3: Types of thyroidectomy at 1650 cases.

Entity	n	%
Total thyroidectomy	1415	85.75 %
Bilateral subtotal thyroidectomy	214	12.96 %
Near-total thyroidectomy	21	1.27 %
Total	1650	100 %

TABLE 4: Localizations of postoperative bleeding.

Entity	n	%
Thyroid lodge	9	52.94 %
Prethyroidal muscles (Anterior jugular veins)	4	23.52 %
Subcutaneous tissue	4	23.52 %
Total	17	100 %

bleedings, drains work to a degree where they're stuck or nonfunctional. For this reason, drain follow-up for bleeding may mislead the surgeon. Thus, at our 4 cases with drains, the drains didn't function well. Besides, it has been reported that drains caused infections and lengthen the hospital stay at thyroidectomy cases.⁵

Agents supplying local hemostasis (surgical or hemostatic sealant) are advised in order to stop bleedings where coagulation cannot be performed due to localization or where ligation cannot control the bleeding. It has been mentioned that minimal postoperative bleedings could be prevented by this way.⁶ While fascia of the neck and muscles anterior to the thyroid are being closed, attention should be paid not to pass through anterior jugular veins. If not, venous-originated postoperative bleedings may occur. At only one of our cases, the suture had passed through anterior jugular vein.

Postoperative bleedings may be observed at operation tables at the stage of awakening. Operating staff stays at the operating room at this stage in case that such a bleeding occurs. At two cases we observed bleeding while the patients were being extubated, we opened the wound and hemostasis was achieved after hematoma was evacuated. First 6 hours are critical for postoperative bleedings. At this period, patients should be followed closely, general situation, breathing and neck of the patient should be observed. Dressing material should be transparent if possible. Bleeding after the first 24 hours are mostly fatal. Mostly they do not require emergent operations.

The cases with bleeding that required reoperation after thyroidectomy has been reported to be between 0.7 %-1.5 %.⁷ This rate was 1 % for our

series. At a series of 750 thyroidectomy cases, it was reported that there were no bleedings.⁸ Although it has been reported that anticoagulant or antiaggregant drugs may cause postoperative bleeding⁹ we met no such cases in our series. But it should be kept in mind that postoperative bleedings may be seen at patients using those drugs with concomitant diseases, and hemostasis should be performed with particular care.

Recurrent and malignant cases are seen more often among cases with postoperative bleeding. These two reasons are mentioned as reasons of bleeding at the literature.^{10,11} Bleedings are observed more often among cases of total thyroidectomy, but considering that rate of total thyroidectomy was 85% and rate of subtotal thyroidectomy was 9.8%, it may be suggested that rate of bleeding is not higher with total thyroidectomy than with subtotal thyroidectomy.

As a conclusion, bleeding after thyroidectomy is a possibly-fatal complication as it causes extreme respiratory distress by massive effect of hematoma and coagulum. Frequency of this complication is higher at the first 6 hours. Patients should be followed closely at this critical period. It's not always obligatory to intervene at the operating room. Transport to the operating room may cause important time loss at some cases. At these cases intervention should be performed at bedside.

After routine hemostasis during the operation, hemostasis control can be repeated with either Valsalva maneuver or bringing the patient to partial Trendelenburg position. For delayed patients, only evacuating the hematoma from the wound may not be enough for relieving respiration. Entubation may also be needed at these cases.

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