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Complications of Thyroidectomy

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ABSTRACT
To research the prevalence of postoperative difficulties following thyroid surgery for various benign and malignant lesions and to corroborate the findings in relation to the depth of the procedure, as well as to offer an expert summary of the rise and fall of surgery for the thyroid. At Gandhi Medical College in Hyderabad, a scientific research was carried out. Statistics originated from 50 patients who had thyroid removals for various thyroid disorders at this centre. In 30 cases (60%), 3 cases (6%), 2 cases (4%) and 15 (30%) cases, respectively, hemithyroidectomy, subtotal, near complete and total thyroidectomies were performed. The overall rate of postoperative complication was 20%. The most prevalent consequences were postoperative hypocalcemia and recurrent laryngeal nerve damage. In 4% of all operated cases, permanent hypocalcemia and recurrent laryngeal nerve injury were observed. The less frequent symptoms were wound hematoma, seroma formation and superior laryngeal nerve injury. In our study, there was no mortality. The overall complication rate can be minimised by operating in a bloodless field, executing a thorough dissection and precisely recognising and preserving recurrent and superior laryngeal nerves, as well as parathyroid glands.

INTRODUCTION

Thyroidectomy is a surgical procedure to remove all or part of the thyroid gland, which is located in the neck and produces hormones that regulate metabolism. While thyroidectomy is generally considered safe, like any surgical procedure, it carries some potential complications. It's important to note that most individuals who undergo thyroidectomy experience no or minimal complications[1-5]. However, here are some possible complications that could arise:

- **Bleeding:** Excessive bleeding during or after surgery is a risk with any surgical procedure, including thyroidectomy. While surgeons take precautions to minimize bleeding, it can occasionally occur and might require additional treatment or a return to the operating room
- **Infection:** Surgical wounds can become infected, leading to pain, swelling, redness and fever. Infections may require antibiotics or further medical attention
- **Scar formation:** Thyroidectomy typically involves an incision in the front of the neck, which can result in a visible scar. The size and appearance of the scar can vary from person to person
- **Damage to surrounding structures:** The thyroid gland is located close to important structures in the neck, such as the parathyroid glands (which control calcium levels) and the recurrent laryngeal nerves (which control the vocal cords). Inadvertent damage to these structures during surgery can lead to temporary or permanent issues with voice, swallowing, or calcium regulation
- **Hypothyroidism:** If the entire thyroid gland is removed (total thyroidectomy), the patient will develop hypothyroidism, a condition where the body doesn't produce enough thyroid hormones. This can be managed with thyroid hormone replacement medication
- **Hyperthyroidism:** In some cases, the underlying reason for thyroidectomy might be hyperthyroidism, an overactive thyroid. If only part of the thyroid gland is removed, there is a risk that the remaining tissue may still produce excess thyroid hormones, requiring further treatment
- **Chyle leak:** A rare complication, chyle leak occurs when lymphatic fluid leaks into the neck after surgery. It may lead to swelling and requires proper management
- **Voice changes:** The surgery can sometimes cause temporary hoarseness or voice changes due to manipulation of the vocal cords or the nerves that control them
- **Hypoparathyroidism:** The parathyroid glands, which control calcium levels, can be inadvertently damaged during surgery, leading to low calcium levels (hypoparathyroidism). This condition may require calcium and vitamin D supplementation

It's essential to discuss the potential risks and complications with your surgeon before undergoing a thyroidectomy. Surgeons take precautions to minimize these risks and the majority of patients recover well with no long-term complications.

MATERIALS AND METHODS

Fifty patients had thyroid surgery at the Gandhi Medical College Hospital in Hyderabad, Telangana, India, for various thyroid problems.

Different professors, Assistant professors and surgical postgraduates overseen by senior surgeons performed hemitotal, subtotal, near total and total thyroidectomy surgeries utilising diverse surgical techniques. A detailed history was obtained from all selected patients, followed by a thorough physical examination. Basic biochemical and haematological assays were done on all individuals. It was decided that additional investigations, such as a thyroid hormone profile and serum calcium estimation, should be requested only when a functional status deficit was detected.

The vocal cords were viewed pre-operatively using an indirect laryngoscope in all patients but post-operative vocal cord examination was only conducted when hoarseness developed.

Recurrent laryngeal nerve injury was documented using direct or indirect laryngoscopy. Chronic hypoparathyroidism was regarded a direct result of treatment in all patients, unless the patient had preexisting hypocalcemia[6-8]. Postoperative hypoparathyroidism and vocal cord paralysis were considered permanent if they lasted a year or longer; however, they were considered transient if they cured before that time. Only those with clinical symptoms were treated for hypocalcemia[9-10]. All surgical records were thoroughly reviewed for information on surgical technique and tumour involvement. These risk factors have been linked to surgical problems.

Patients were classified as having hypocalcaemia (hyperparathyroidism) if both clinical and biochemical evidence (a decrease in corrected blood calcium concentration below 8 mg dL^{-1} and/or the need for calcium supplementation) were present[11].

RESULTS

This case study comprised 50 patients who undergone various thyroid surgeries. About 38 (76%) patients were female, while 12 (24%) were male (Table 1).

In this study group, 26 patients (52%) had nontoxic multinodular goitre (MNG), fourteen patients (14%) had nontoxic solitary nodular goitre, nine patients (18%) had carcinoma thyroid and one patient (2%) had Hashimoto's thyroiditis (Table 2).

Table 1: Gender distribution

Gender	No. of patients (%)
Male	12 (24%)
Female	38 (76%)

Table 2: Patients with diagnosis of thyroidectomy

Diagnosis	No. of patients (%)
Multinodular goiter	26 (52%)
Solitary nodule	14 (28%)
Carcinoma thyroid	9 (18%)
Hashimoto's thyroiditis	1 (2%)

Table 3: Patients with various thyroidectomy surgeries

Surgery	No. of patients(%)
Hemithyroidectomy	30 (60%)
Subtotal thyroidectomy	3 (6%)
Near total thyroidectomy	2 (4%)
Total thyroidectomy	15 (30%)

Table 4: Patients with thyroidectomy complications

Complication	No. of patients (%)
Recurrent laryngeal nerve injury	4 (8%)
Superior laryngeal nerve injury	1 (2%)
Hypocalcemia	4 (8%)
Hematoma formation	2 (4%)
Wound infection	1 (2%)

The following thyroid operations were carried out (Table 3). Hemithyroidectomy was the most common procedure (60%).

Postoperative complications occurred at an incidence of 12% overall. The most prevalent surgical complications were hypocalcemia and recurrent laryngeal nerve injury (RLNI) in four patients each (Table 4). Recurrent laryngeal nerve injuries occurred in 8% (four cases) of all operated cases and accounted for 8% of all complications. All of the injuries were unilateral, whether temporary or permanent. In 5% and 2.5% of cases, respectively, transient and persistent RLNI occurred. In 4% of instances, transient hypocalcemia was observed. Due to compressive sensations and continued haemorrhage, two patients developed postoperative hematomas and were reoperated on the fifth postoperative day. Table 4 lists other less common postoperative problems such as wound infection after thyroid surgery. None of the subjects in our series underwent hyperthyroidism surgery.

DISCUSSIONS

Kocher performed over 5,000 thyroid surgeries throughout the course of his career and he documented early closure of inferior thyroid arteries, which significantly reduced blood loss[6]. The overall rate of complications in our series was 20%, which is consistent with other studies, which reported 217 and 24%, respectively. Hematoma formation following thyroidectomy is a rare occurrence that occurs in 1-2% of all such procedures[12]. The majority of these anticipated and life-threatening consequences occur within 24 hrs of surgery. These individuals have breathing difficulties, pain and pressure, dysphagia and drainage[13]. Only one patient in our series developed a hematoma on the fifth day, which was quickly checked and emptied.

Injury to the SLN, whether transient or permanent, typically goes unnoticed and hence remains unreported. In 1935, the relevance of SLN became an existential fact after world-famous opera soprano Amelita Galli-Curci underwent thyroid surgery and lost her upper vocal registry as a result[14]. SLN injury causes vocal tiredness, decreased voice tone and difficulty singing note intonation[11]. The SLN is generally protected by ligation of superior thyroid arteries near the gland's capsule. Recurrent laryngeal nerve injury is one of the most incapacitating side effects of thyroid surgery (Table 4). Billroth's first helper, Wolfler, stressed the significance of RLN protection during thyroid surgery. He was the first to offer a complete explanation of RLN anatomy and surgical possibilities. Following thyroidectomy, one patient had a seroma, which was not a serious complication. Percutaneous aspiration is effective for clinically evident seromas, as seen in our case. The extent of surgery (bilateral) or thyroidectomy for large goitres is directly related to the development of seroma[15].

In the great majority of cases, hypothyroidism is not considered a complication following thyroid surgery[16]. It is preferable to consider it an expected outcome. After a total or partial thyroidectomy, permanent thyroid insufficiency should be expected. Infections after thyroidectomies are extremely rare, with rates as low as 0.311 or 0.4% reported in various studies.

There have been reports of rare problems induced by cranial excessive extension during surgery, such as vertigo, headache and nausea[11] but no such issues were detected in our series. There have also been reports of very rare consequences such as Claude-Bernard-Horner syndrome and punctiform corneal lesions resulting in serious visual damage[16]. After thyroid surgery, hypertrophic scarring or keloid formation is infrequent. In our investigation, no such issues were identified.

CONCLUSION

In conclusion, thyroidectomy is generally a safe and effective surgical procedure for treating various thyroid conditions. However, like any surgery, it comes with potential complications. It's essential for patients to be aware of these risks and discuss them thoroughly with their healthcare team before undergoing the procedure. Some of the possible complications include: Bleeding, Infection, Scar formation, Hypoparathyroidism (low calcium levels), Recurrent laryngeal nerve injury (voice changes), Hypothyroidism (if the entire thyroid is removed), Hematoma (collection of blood), Keloid formation

(thickened scars). While these complications are possible, the likelihood and severity can vary depending on individual factors and the surgeon's experience. Skilled surgeons and proper post-operative care can significantly reduce the risk of complications and contribute to a successful recovery. If you are considering a thyroidectomy, have a comprehensive discussion with your medical team to understand the benefits, risks and potential outcomes associated with the procedure.

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