

# Thyroidectomy in Children at Louga Regional Hospital: A Study of 18 Cases

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## Abstract

**Introduction:** Thyroid disorders are the second most common endocrine condition after diabetes mellitus, affecting approximately 5% of the global population. The World Health Organisation (WHO) estimates that 800 million individuals suffer from goitre, with a prevalence rate of 22.9%. The objective of this study was to analyse the epidemiological, clinical, and therapeutic profiles of thyroidectomies in paediatric patients at Louga Regional Hospital. **Materials and Methods:** This was a retrospective study conducted over a four-year period, from 1 January 2017 to 31 December 2020. **Results:** The mean age of the patients was 11.78 years, with extremes ranging from 6 to 15 years. The most affected age group was 11 to 15 years, accounting for 13 cases (72.22%). All patients were female (100%). The primary indication for surgery was multinodular goitre, which accounted for 9 cases (50% of surgical indications), followed by Graves' disease in 8 patients (44.44%). Histopathological analysis of the surgical specimens revealed that, of the 18 thyroidectomies performed, 10 patients (55.56%) had their histological examination completed, with 2 cases of malignancy identified. Two cases (11.11%) of laryngeal dyspnoea were noted upon awakening and one case (5.56%) of dysphonia. **Conclusion:** Paediatric thyroid surgery is less frequent but characterised by narrower anatomical structures, particularly the recurrent laryngeal nerve, which is finer compared to adults.

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## Keywords

Thyroid, Patient, Indication

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### 1. Introduction

The thyroid is an endocrine gland located in the anterior cervical region and is closely associated with surrounding anatomical structures. It may present with anatomy-histological abnormalities (goitre, nodules, cancer), functional disorders (hyperthyroidism, hypothyroidism), or lead to compression of neighbouring structures [1]. Thyroid diseases are diverse and frequent, particularly in females [2]. The World Health Organisation (WHO) estimates that there are 800 million individuals with goitre, with a global prevalence of 22.9% [3]. Familial thyroid cancers of follicular origin are rare and involve tumours associated with syndromes or non-syndromic cancers. In familial adenomatous polyposis, the prevalence of thyroid cancer ranges between 2% - 12% and occurs in 20% - 40% of cases [4]. Dysthyroidism (hyperthyroidism or hypothyroidism) is considerably rarer in children and adolescents compared to adults [5]. According to a bicentric cross-sectional study conducted in Niger, thyroidectomy represented 4.18% of surgical procedures in visceral and general surgery departments and mainly concerned women in 88.63% of cases [6]. Surgical intervention remains a crucial therapeutic option in certain thyroid conditions, particularly in cases of thyroid cancer, large nodules, multinodular goitre, and hyperthyroidism [7].

### 2. Objective

#### General Objective

To study the epidemiological, clinical, paraclinical, and therapeutic aspects of thyroidectomies in children within the ENT and CCF service of Louga Regional Hospital.

#### Specific Objectives

- To determine the frequency of thyroidectomy in the paediatric population within the service.
- To identify the primary therapeutic indications.
- To catalogue and analyse the various complications related to this surgery.

### 3. Patients and Methods

This was a retrospective study covering a four-year period from 1 January 2017 to 31 December 2020. Patients aged 15 years or younger who underwent thyroidectomy were included in our study, regardless of race, ethnicity or gender. Patients who met the age criteria but had incomplete medical records were excluded from the study. All data are confidential and will only be used for academic purposes. Informed parental consent was obtained from all patients prior to the study. Clinical observation files, operative protocol records, and consultation registers were

used to collect data. An exhaustive sampling method was employed. Given the sample size, data were entered and processed using Excel from the Office 2016 software package.

#### 4. Results

Out of a total of 427 thyroidectomies performed during the study period, thyroidectomy in paediatric patients accounted for 18 cases, representing 4.22%. The mean age of the patients was 11.78 years, with extremes ranging from 6 to 15 years. The 6 - 10 years age group accounted for 5 cases (27.78%), while the 11 - 15 years group represented 13 cases (72.22%). All patients were female (100%). The clinical signs are summarised in **Table 1**.

**Table 1.** Distribution of patients according to clinical signs.

	Number of Cases	Percentage
Cervical mass	18	100%
Exophthalmos	7	38.89%
Palpitations	6	33.33%
Weight loss	6	33.33%
Nervousness	4	22.22%
Weight gain	2	11.11%
Bradypnoea	2	11.11%

Seven (7) patients had a family history of goitre, accounting for 38.89% of cases.

The consultation delay was 12 months for 14 patients (77.78%), 24 months for 3 patients (16.67%), and 36 months for 1 patient (5.55%).

All patients underwent cervical ultrasound, which revealed 9 cases (50%) of multinodular goitre, 8 cases (44.44%) of Graves' disease, and 1 case (5.56%) of multinodular goitre with features of Graves' disease. No signs of tracheal compression were observed.

Thyroid-stimulating hormone (TSH) assays were conducted in all patients, revealing 9 cases (50%) of hyperthyroidism, 8 cases (44.44%) of euthyroidism, and 1 case (5.56%) of hypothyroidism.

All of the patients had an echography, but none of them underwent EU-TI-RADS ultrasound classification, and no fine-needle aspiration cytology was performed.

The surgical indications are summarised in **Table 2**.

**Table 2.** Distribution of patients according to surgical indication.

	Number of Cases	Percentage
Multinodular Goitre (MNG)	9	50%
Graves' disease	8	44.44%
MNG with hyperthyroidism	1	5.56%
Total	18	100%

## 5. Surgical Management

Eight (8) patients (44.44%) were on synthetic antithyroid drugs and beta-blockers before undergoing total thyroidectomy. Total thyroidectomy in a euthyroid state was performed in all patients (100%). The parathyroid glands were visualised and preserved in all cases. The excision of the gland was straightforward, with minimal fibrotic tissue, and haemostasis was satisfactory. Systematic drainage was employed in all patients, and the drains were removed on the second postoperative day.

## 6. Postoperative Outcomes

The postoperative course was uncomplicated in 15 patients (83.33%). We noted two cases (11.11%) of laryngeal dyspnoea upon awakening, which were treated with corticosteroids, and one case (5.56%) of dysphonia, which was managed with vitamin therapy and corticosteroids. After one year of follow-up, there were no recurrences in our cohort.

None of the patients underwent indirect laryngoscopy or nasofibroscope before or after surgery.

The results of the histopathological examination of the surgical specimens are summarised in **Table 3**.

**Table 3.** Distribution of patients according to histopathological results of surgical specimens.

	Number of Cases	Percentage
Not performed	8	44%
Graves' disease	6	33.33%
Multinodular Goitre (MNG)	1	5.56%
MNG with hyperthyroidism	1	6%
Papillary carcinoma	1	5.56%
Follicular carcinoma	1	5.56%
Total	18	100%

## 7. Discussion

### Study Limitations and Challenges:

One of the limitations of this study is its retrospective nature: some medical records were missing or incomplete, making it difficult to collect the desired information; in addition, eight (8) patients, or 44.44%, had not performed a histological examination. All of that may lead to bias.

Our study revealed a problem related to the technical platform, in particular, the cytopuncture and the histopathological examination. Making these two examinations accessible to all patients will be a major step forward in the management of thyroid pathologies.

### 7.1. Sociodemographic Aspects

In our study, 18 out of 427 patients who underwent surgery for goitre were children, representing 4.22% of the cases over a four-year period, with an average of 4.5 children per year. Our results are lower than those reported by Mechteld *et al.* [8] in the United Kingdom, where the frequency of total thyroidectomy in children was 11.1% among 960 patients.

The mean age in our study was 11.78 years, which aligns with the findings of Akkari *et al.* [9], who reported a mean age of  $12.5 \pm 0.7$  years. However, our results are lower than those of El Omri *et al.* [10] and Wood *et al.* [11], who reported mean ages of 14.6 years and 13 years, respectively.

All our patients were 100% female, although there were no gender-related restrictions. El Omri *et al.* [10] and Wood *et al.* [11] found this female predominance with 90.5% and 69% of cases, respectively. According to the literature, thyroid pathology is characterized by a predominance of women [9]. The presence of steroid sex receptors in follicular cells seems to favor this female predominance. In our case, the fact that we were not male was linked to chance.

### 7.2. Diagnostic Aspects

Thyroid surgery in children sometimes follows the same indications as in adults [12]. Thyroid pathology in children and adolescents is dominated by four major entities: nodules, multinodular goitre, Graves' disease, and familial medullary thyroid carcinoma (FMTC) [13]. In our study, we found three groups of surgical indications: Graves' disease, multinodular goitre, and multinodular goitre with hyperthyroidism. Multinodular goitre was the most common indication, representing 50% of cases, followed by Graves' disease at 44.44%. Our results are higher than those reported by M. Akari [9] and Wood *et al.* [11], who showed 12.3% and 5.7% of multinodular goitre as the surgical indication, respectively. El Omri *et al.* [10] found Graves' disease to account for 22.7% of surgical indications.

Unlike other studies, we did not routinely perform fine-needle aspiration biopsies, mainly due to the limited number of cytopathologists in Senegal. As highlighted by Baldé *et al.* [14], the high cost of certain examinations and the financial limitations of patients restrict the possibility of conducting some complementary tests. Clinical suspicion alone is often strong enough to justify surgical treatment, followed by histological examination of the excised specimen.

### 7.3. Therapeutic Aspects

We performed total thyroidectomy in a euthyroid state for all 18 patients (100%). This predominance of total thyroidectomy has been reported by other authors, including Keita *et al.* in 2018, 60% [15], El Omri *et al.* in 2023, 54.4% [10] and Wood *et al.* in 2011, 54% [11]. Over the past 20 years, some surgeons have agreed that total thyroidectomy should not be reserved for cancer only but can be extended to benign forms of goiter [16].

However, Casanelli *et al.* [17] showed that in developing countries such as Côte

d'Ivoire, partial thyroid excision was the most widely used treatment option in benign goitre surgery because of the difficulties in accessing hormone therapy. Similarly, Touré *et al.* in 2006 [18] showed that subtotal thyroidectomy was the most performed procedure in their study.

Total or partial thyroidectomy has long been considered the gold standard in cervical surgery [19]. We now perform total thyroidectomy in preference to subtotal thyroidectomy, as it has the advantage of immediately and permanently eliminating thyrotoxicosis symptoms and preventing recurrences and the complications associated with reoperation after subtotal thyroidectomy [20] [21].

#### 7.4. Postoperative Outcomes

The postoperative course was uncomplicated in 15 of our patients (83.33%). Two cases of laryngeal dyspnoea upon awakening (11.11%) were treated with corticosteroids, and one case of dysphonia (5.56%) was managed with vitamin therapy and corticosteroids. After a follow-up period of one year, no recurrences were observed in our study. The study by El Omri *et al.* [10] also reported favourable postoperative outcomes for all his patients.

#### 7.5. Histopathological Aspects

In our study, the malignancy rate was 20%. This result is consistent with the findings of Mediouni *et al.* [22], who reported a malignancy rate of 30.5% in a study conducted in Tunisia. However, our rate is higher than that reported by Illé *et al.* [23], who found a malignancy rate of 1.28% in a five-year study conducted in Niger. Multinodular goitre accounted for 5.56% of cases in our study, which is significantly lower than the 31.82% reported by El Omri *et al.* [10].

### 8. Conclusion

Thyroid surgery has become a common practice in our healthcare facilities. The main indications for surgery are multinodular goitre (MNG) and Graves' disease. This type of surgery can be complicated by vascular and nerve-related issues, which highlights the need for surgical precision and expertise, particularly with regard to the recurrent laryngeal nerve.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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