

Surgical Outcomes of Benign Thyroid Disorders in a Tertiary Care Hospital

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Received: 22-03-2026 / Revised: 24-04-2026 / Accepted: 28-05-2026

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Conflict of interest: Nil

Abstract:

Background: Common endocrine problems that necessitate surgery include follicular adenomas, colloid goitre, solitary thyroid nodules, and multinodular goitre. Neck oedema, compressive discomfort, cosmetic issues, or ambiguous cytology are common presentations. For those with symptoms, thyroidectomy is still the only effective treatment. Although postoperative problems have decreased due to advancements in surgical procedures, wound infection, hematoma, seroma, recurrent laryngeal nerve damage, and temporary hypocalcemia are still major concerns. Improving patient safety, treatment efficacy, and general care quality all depend on evaluating surgical outcomes.

Methods: 110 patients who had surgery for benign thyroid conditions over the course of eight months at Anugrah Narayan Magadh Medical College and Hospital in Gaya Ji, Bihar, were the subjects of a retrospective observational study. IBM SPSS Statistics version 26.0 was used to analyse demographic, clinical, surgical, histological, and postoperative outcome data. The Chi-square/Fisher's exact test was used to compare categorical variables; $p < 0.05$ was deemed statistically significant.

Results: The average patient age was 41.8 ± 12.3 years, and 83.6% of cases were female. The most frequent reason for surgery was multinodular goitre (45.5%). The most common operation was hemithyroidectomy (52.7%). All patients had benign illness verified by histopathology, with colloid goitre (42.7%) being the most common diagnosis. 15.5% of patients experienced postoperative problems, primarily temporary hypocalcemia (7.3%). Overall surgical success was over 90%, and hemithyroidectomy was linked to significantly fewer problems than total thyroidectomy ($p = 0.018$).

Conclusion: Thyroid surgery for benign thyroid disorders is a safe and effective treatment when performed using meticulous surgical techniques. Low complication rates, favorable histopathological outcomes, and excellent postoperative recovery support surgical intervention in appropriately selected patients. Careful preoperative evaluation, standardized operative protocols, and vigilant postoperative monitoring contribute significantly to improved surgical outcomes.

Keywords: Benign Thyroid Disorders; Thyroidectomy; Multinodular Goiter; Hemithyroidectomy; Total Thyroidectomy; Surgical Outcomes; Postoperative Complications; Retrospective Study.

DOI: 10.25258/ijcpr.18.5.286

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Introduction

One of the most common endocrine illnesses requiring surgery in the globe is benign thyroid problems. Multinodular goitre, solitary thyroid nodules, colloid goitre, follicular adenoma, thyroid cysts, and toxic nodular goitre are only a few of the pathogenic entities that fall within this broad category. Benign thyroid illness is more common in women and in areas with low iodine levels, and its incidence is rising in middle-aged adults. While many benign thyroid tumours are asymptomatic,

increasing development may result in hyperthyroidism, compressive symptoms including dysphagia and dyspnea, cosmetic deformities, or suspicions of cancer that require surgical treatment. For symptomatic benign thyroid diseases that do not respond to conservative care or show notable clinical progression, thyroidectomy continues to be the mainstay of treatment. Surgical options include hemithyroidectomy, partial thyroidectomy, near-total thyroidectomy, and total thyroidectomy,

depending on the kind and severity of the disease [1].

The size and distribution of thyroid lesions, thyroid function status, cytological results, patient preference, and surgeon skill are some of the variables that influence the surgery selection. In addition to achieving total disease eradication, modern thyroid surgery strives to minimise complications, maintain parathyroid gland vascularity, protect recurrent laryngeal nerve function, and enhance patient outcomes. Thyroid surgery is still linked to potential complications like postoperative haemorrhage, seroma formation, wound infection, temporary or permanent hypocalcemia due to parathyroid injury, recurrent laryngeal nerve palsy, and postoperative hypothyroidism, despite significant improvements in surgical techniques, anaesthesia, and perioperative care. Recovery, hospital stays, medical expenses, and long-term quality of life can all be greatly impacted by these issues. Therefore, ensuring patient safety, enhancing clinical practice, and honing surgical skills all depend on ongoing examination of surgical outcomes [2].

Thyroid function tests, ultrasonography, and fine-needle aspiration cytology (FNAC) have become essential elements of preoperative evaluation, enabling precise diagnosis and suitable surgical planning. The gold standard for verifying benign pathology after surgery and ruling out occult cancer is still histopathological evaluation. While thyroidectomy outcomes have been assessed in a number of research, there is still a dearth of regional data from eastern India. Improving institutional procedures and patient counselling requires an understanding of area demographics, disease trends, surgical profiles, and postoperative problems. In order to assess the surgical results of benign thyroid disorders, ascertain the frequency of postoperative complications, and pinpoint variables linked to effective surgical management, the current retrospective study was conducted at the Department of General Surgery, Anugrah Narayan Magadh Medical College and Hospital, Gaya Ji, Bihar [3].

Materials and Methods

Study Design and Setting: This retrospective observational study was conducted in the Department of General Surgery, Anugrah Narayan Magadh Medical College and Hospital (ANMMCH), Gaya Ji, Bihar, India. The study included patients who underwent surgery for benign thyroid disorders over a period of 8 months. Medical records were retrospectively reviewed after obtaining approval from the Institutional Ethics Committee (IEC Approval No.: IEC/ANMMCH/GS/2025/XXX). Patient confidentiality was maintained by anonymizing all clinical information.

Study Population: A total of 110 patients diagnosed with benign thyroid disorders and treated surgically during the study period were included in the analysis.

Inclusion Criteria

- Patients aged ≥ 18 years.
- Patients diagnosed with benign thyroid disorders based on clinical examination, ultrasonography, thyroid function tests, and FNAC.
- Patients who underwent hemithyroidectomy, subtotal thyroidectomy, near-total thyroidectomy, or total thyroidectomy.
- Histopathological confirmation of benign thyroid disease.
- Complete medical records with perioperative and follow-up data.

Exclusion Criteria

- Histopathologically confirmed thyroid malignancy.
- Patients managed conservatively without surgery.
- Revision thyroid surgeries.
- Patients with incomplete medical records.
- Patients with associated parathyroid disorders or previous neck irradiation.

Sample Size

The study included all eligible patients ($n = 110$) who underwent surgery for benign thyroid disorders during the study period. Consecutive sampling was employed to minimize selection bias.

Data Collection

Data were collected from hospital inpatient records, operation theatre registers, pathology reports, anesthesia records, and follow-up outpatient files using a structured proforma.

The following variables were recorded:

Demographic Variables

- Age
- Gender
- Residence (Urban/Rural)

Clinical Variables

- Duration of neck swelling
- Presenting symptoms
- Thyroid function status
- Comorbidities
- Ultrasonography findings
- Fine-Needle Aspiration Cytology (FNAC) diagnosis

Outcome Measures

Primary Outcome

- Overall surgical outcome measured by successful surgery without major postoperative complications.

Secondary Outcomes

- Postoperative complications.
- Histopathological diagnosis.
- Duration of hospital stay.
- Factors associated with postoperative complications.

Statistical Analysis: The collected data were entered into Microsoft Excel and analyzed using IBM SPSS Statistics version 26.0 (IBM Corp., Armonk, NY, USA).

Continuous variables were expressed as mean $\pm$ standard deviation (SD) or median with interquartile range (IQR), depending on data distribution. Categorical variables were summarized as frequencies and percentages.

Comparisons between categorical variables were performed using the Chi-square test or Fisher's Exact test where appropriate. Continuous variables were compared using the Independent Student's t-test or one-way ANOVA for normally distributed data.

A multivariate logistic regression analysis was performed to identify independent predictors of postoperative complications. Adjusted odds ratios (AOR) with 95% confidence intervals (CI) were calculated.

A p-value <0.05 was considered statistically significant.

Results

Among the 110 patients included in this retrospective study, benign thyroid disorders predominantly affected middle-aged women from rural areas. Colloid goiter and multinodular goiter were the most common pathological diagnoses. Hemithyroidectomy was the preferred surgical procedure and was associated with fewer postoperative complications than more extensive resections. Transient hypocalcemia represented the most frequent complication, whereas permanent recurrent laryngeal nerve palsy was rare. Advanced age, hyperthyroidism, total thyroidectomy, longer operative duration, and prolonged hospitalization were significant predictors of postoperative complications. Overall, more than 90% of patients achieved excellent or good surgical outcomes, supporting thyroidectomy as a safe and effective treatment for benign thyroid disorders when performed in a tertiary care setting.

Table 1: Demographic Characteristics of the Study Population (N = 110)

Variable	Frequency	Percentage	p-value
Age Group (years)			0.028*
18–30	22	20.0	
31–45	46	41.8	
46–60	30	27.3	
>60	12	10.9	
Gender			
Female	92	83.6	$<0.001^*$
Male	18	16.4	
Residence			
Urban	42	38.2	
Rural	68	61.8	0.017*

Interpretation: The majority of patients were between 31 and 45 years (41.8%), with a marked female predominance (83.6%, $p<0.001$). Most patients were from rural areas (61.8%, $p=0.017$),

reflecting the higher burden of benign thyroid disorders among rural populations attending this tertiary care center.

Table 2: Clinical Presentation

Clinical Variable	Frequency	Percentage	p-value
Neck swelling	110	100.0	—
Cosmetic concern	66	60.0	0.041*
Dysphagia	38	34.5	0.022*
Dyspnea	18	16.4	0.109
Hyperthyroid symptoms	20	18.2	0.081
Pain	14	12.7	0.247

Interpretation: All patients presented with neck swelling. Cosmetic concern (60.0%) and dysphagia

(34.5%) were the most common associated symptoms and were significantly associated with surgical intervention ($p < 0.05$).

Table 3: Thyroid Function Status

Thyroid Function	Frequency	Percentage	p-value
Euthyroid	79	71.8	
Hyperthyroid	18	16.4	
Hypothyroid	13	11.8	0.003*

Interpretation: Most patients were euthyroid (71.8%), while hyperthyroidism and hypothyroidism were less common. Thyroid function distribution was statistically significant ($p = 0.003$).

Table 4: FNAC Diagnosis

FNAC Finding	Frequency	Percentage	p-value
Colloid goiter	48	43.6	
Benign follicular lesion	24	21.8	
Nodular hyperplasia	20	18.2	
Hashimoto thyroiditis	10	9.1	
Thyroid cyst	8	7.3	<0.001*

Interpretation: Colloid goiter was the predominant preoperative cytological diagnosis (43.6%), followed by benign follicular lesions. FNAC demonstrated a significant predominance of benign pathology ($p < 0.001$).

Table 5: Type of Surgery Performed

Procedure	Frequency	Percentage	p-value
Hemithyroidectomy	58	52.7	
Total thyroidectomy	39	35.5	
Near-total thyroidectomy	9	8.2	
Subtotal thyroidectomy	4	3.6	0.011*

Interpretation: Hemithyroidectomy was the most commonly performed procedure (52.7%), followed by total thyroidectomy (35.5%). The distribution of surgical procedures was statistically significant ($p = 0.011$).

Table 6: Histopathological Diagnosis

Histopathology	Frequency	Percentage	p-value
Colloid goiter	47	42.7	
Multinodular goiter	30	27.3	
Follicular adenoma	17	15.5	
Hashimoto thyroiditis	10	9.1	
Thyroid cyst	6	5.4	<0.001*

Interpretation: Colloid goiter was the most frequent histopathological diagnosis (42.7%), followed by multinodular goiter (27.3%). All specimens confirmed benign thyroid pathology.

Table 7: Postoperative Complications

Complication	Frequency	Percentage	p-value
None	93	84.5	
Transient hypocalcemia	8	7.3	
Seroma	3	2.7	
Wound infection	2	1.8	
Hematoma	2	1.8	
Transient RLN palsy	1	0.9	
Permanent RLN palsy	1	0.9	0.019*

Interpretation: Most patients (84.5%) had an uncomplicated postoperative course. Transient hypocalcemia was the most common complication (7.3%), while permanent recurrent laryngeal nerve palsy occurred in only one patient.

Table 8: Length of Hospital Stay

Hospital Stay	Frequency	Percentage	p-value
≤3 days	64	58.2	
4–5 days	34	30.9	
>5 days	12	10.9	0.026*

Interpretation: The majority of patients (58.2%) were discharged within three days after surgery,

indicating favorable postoperative recovery and efficient perioperative care.

Table 9: Factors Associated with Postoperative Complications

Variable	Complications (n=17)	No Complications (n=93)	p-value
Age >45 years	11	31	0.032*
Total thyroidectomy	11	28	0.018*
Hyperthyroidism	6	12	0.041*
Operative time >120 min	10	23	0.007*
Hospital stay >5 days	8	4	<0.001*

Interpretation: Older age, total thyroidectomy, hyperthyroid status, prolonged operative duration,

and extended hospital stay were significantly associated with postoperative complications.

Table 10: Overall Surgical Outcomes

Outcome	Frequency	Percentage	p-value
Excellent recovery	82	74.5	
Good recovery	20	18.2	
Fair recovery	6	5.5	
Poor recovery	2	1.8	<0.001*

Interpretation

Excellent postoperative recovery was observed in 74.5% of patients, and 92.7% experienced either excellent or good outcomes. These findings indicate that thyroid surgery for benign disorders achieved high rates of clinical success with low postoperative morbidity.

Discussion

The current retrospective study assessed the surgical results of 110 patients at Anugrah Narayan Magadh Medical College and Hospital in Gaya Ji, Bihar, who underwent thyroid surgery for benign thyroid diseases. The results show that thyroidectomy is a safe and efficient treatment option for benign thyroid conditions, with good histological results, low rates of complications, and great postoperative recovery. In order to improve perioperative patient care and surgical decision-making, the study also found a number of factors linked to postoperative problems. Eighty-six percent of the patients in this study were female and between the ages of thirty-one and forty-five. The higher prevalence of benign thyroid problems among women, which has been linked to hormonal factors, autoimmune predisposition, pregnancy-related physiological changes, and increased healthcare use, is consistent with this female preponderance [4].

Numerous Indian and foreign studies assessing benign thyroid disorders have revealed similar demographic trends. The majority of patients come from rural areas, which probably reflects regional

differences in iodine nutrition, access to treatment, delayed presentation, and socioeconomic variables that still affect the epidemiology of thyroid illness in developing nations. The most common presenting complaint was neck swelling, and the most common related symptoms that required surgery were dysphagia and cosmetic issues. These results are predicted as benign thyroid tumours that progressively develop frequently cause compressive discomfort and apparent neck deformities that negatively impact daily activities and quality of life. The majority of patients were euthyroid upon presentation, demonstrating that the primary justification for surgery in benign thyroid illness is still structural thyroid abnormalities rather than functional disorders [5].

Colloid goitre is the most frequent cytological diagnosis made with fine-needle aspiration cytology (FNAC), which has proven to be a useful preoperative diagnostic technique. Colloid goitre and multinodular goitre accounted for the bulk of surgical specimens, and histopathological testing revealed benign pathology in all cases. The high degree of agreement between FNAC and final histology highlights the accuracy of preoperative cytological screening in identifying suitable surgical candidates and reducing needless surgery for malignant lesions. In this study, hemithyroidectomy and complete thyroidectomy were the most frequently performed surgical procedures. In order to maintain thyroid function and lower postoperative morbidity, limited thyroid illness is treated by unilateral excision, which is why

hemithyroidectomy is preferred. For bilateral multinodular goitre, diffuse benign disease, or recurrent pathology, a total thyroidectomy was the only option. The substantially lower prevalence of complications seen after hemithyroidectomy as opposed to whole thyroidectomy is in line with previous research and encourages customised surgical method selection based on patient characteristics and the severity of the condition [6].

Transient hypocalcemia was the most common postoperative complication, although generally the prevalence was low. Temporary hypocalcemia usually goes away with conservative calcium administration and is often caused by temporary ischemia, manipulation, or oedema of the parathyroid glands during surgery. Only one patient developed permanent recurrent laryngeal nerve (RLN) palsy, demonstrating rigors neural structure preservation and surgical dissection. Adherence to standard surgical principles and adequate perioperative therapy is further demonstrated by the minimal incidence of wound infection, hematoma, and seroma. The discovery of parameters strongly associated with postoperative problems was one of the study's key findings. Increased postoperative morbidity was independently linked to older age, hyperthyroidism, complete thyroidectomy, longer hospital stays, and longer surgical times. Larger goitres, numerous comorbidities, and more difficult surgical anatomy are common in elderly patients, all of which may increase the risk of complications. In a similar vein, the technical complexity of surgery is increased by hypervascularity in hyperthyroid glands and the larger degree of dissection needed for a total thyroidectomy. Surgeons can optimise patient selection, apply targeted perioperative methods, and provide customised postoperative surveillance when they are aware of these risk variables [7].

Over 90% of patients had excellent or satisfactory postoperative recovery, indicating a very positive overall surgical outcome. These results are consistent with published reports from tertiary care facilities, where thyroidectomy-related problems have significantly decreased due to advancements in anaesthesia, standardised surgical techniques, better preoperative imaging, and improved postoperative protocols. The significance of skilled surgeons, interdisciplinary perioperative care, and adherence to evidence-based surgical protocols is further highlighted by high surgical success rates. The inclusion of a comparatively large cohort, thorough investigation of demographic, clinical, cytological, operational, and histological variables, and identification of factors linked to postoperative problems are some of the study's merits. It is important to recognise some limitations, though. The study's single-center design may restrict external validity, and the retrospective design is vulnerable to selection and information bias. Due to

a lack of follow-up data, long-term outcomes such as postoperative hypothyroidism, recurrence, scar satisfaction, and patient-reported quality of life were not assessed. To confirm these results and bolster the evidence for the best surgical treatment of benign thyroid diseases, future prospective multicenter trials with longer follow-up times and patient-reported outcome measures are advised [2].

Overall, the current study supports thyroidectomy's status as the final treatment for carefully chosen patients with benign thyroid diseases by confirming that it is linked to good clinical results and low morbidity when carried out in a tertiary care context.

Conclusion

The current retrospective study shows that, when carried out at a tertiary care facility by skilled surgeons, surgical management of benign thyroid diseases is a safe, efficient, and dependable treatment option. Neck oedema was the most common clinical sign of multinodular or colloid goitre in the majority of patients, who were middle-aged women. The most common procedure was hemithyroidectomy, which had a lower postoperative morbidity rate than total thyroidectomy.

Permanent recurrent laryngeal nerve damage was uncommon, and temporary hypocalcemia was the most frequent adverse event among the few postoperative problems. The correctness of thorough preoperative evaluation, which includes clinical assessment, thyroid function testing, ultrasonography, and fine-needle aspiration cytology, was demonstrated by the histopathological study, which revealed benign illness in every patient. Significant predictors of postoperative problems included advanced age, hyperthyroidism, longer operating times, and complete thyroidectomy. These findings highlight the significance of cautious patient selection, customised surgical planning, and close perioperative monitoring.

Overall, almost 90% of patients had excellent or good postoperative recovery, demonstrating the value of comprehensive perioperative care and standardised surgical approaches. These results confirm that thyroidectomy is the best course of action for symptomatic benign thyroid conditions that call for surgery. This study offers useful institutional data that could help improve clinical practice and patient counselling, despite its limitations due to its retrospective methodology and single-center location. To further optimise surgical management and improve patient-centered care in benign thyroid disease, future prospective multicenter studies with long-term follow-up and evaluation of functional outcomes and quality of life are necessary.

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