

# Incidental Thyroid Carcinoma in Benign Thyroid Disease: A Cohort Study

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## ABSTRACT

**Aim:** An incidental thyroid carcinoma (ITC) is a thyroid malignancy that is not clinically or cytologically detected preoperatively. The incidence of ITC is between 10% to 20% in the literature. A study was undertaken to assess the incidence of ITC in patients undergoing total thyroidectomy for benign disease of the thyroid to University Surgical Unit, North Colombo Teaching Hospital (NCTH), Sri Lanka.

**Materials and methods:** Prospective cohort study was undertaken from November, 2002 to October, 2015. Patients with palpable thyroid nodules were assessed with fine needle aspiration cytology (FNAC) and ultrasound scan (USS) to ascertain benign thyroid disease (BTD). Hormone assays were conducted to detect thyroid status. All patients with BTD who underwent total thyroidectomy were included in the study. Histopathological assessments were made by a panel of pathologists. Patients with autoimmune thyroiditis (AIT) were excluded due to the known association with malignancy of the thyroid. Post-thyroidectomy histopathological diagnoses were collected prospectively and patients with ITC were identified. Statistical analysis was done using statistical package for the social sciences (SPSS) software, version 20.

**Results:** Hundred and sixty seven patients (n = 167) who fulfilled the inclusion criteria were analysed (Male–20, female–147, median age = 40.25 year, range 28 year–62 year). ITC was found in 19 patients with an incidence of 11.38%. No significant association was noted with morphology, biochemical status of the thyroid or gender.

**Conclusion:** Incidence of ITC is 11.38% in this cohort. Incidence of ITC being approximately 1:10 emphasizes the need to consider total thyroidectomy in the management of BTD.

**Keywords:** Goiter, Thyroid cancer, Thyroid carcinoma, Thyroid surgery, Thyroidectomy.

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## INTRODUCTION

Incidental thyroid carcinoma (ITC) or occult carcinoma of the thyroid is a thyroid cancer which is not diagnosed preoperatively. The term 'occult thyroid carcinoma' has come into surgical use since the mid-20th century.<sup>1</sup> Routine clinical, radiological, biochemical or cytological assessments fail to detect the presence of a carcinoma. The postoperative histopathological analysis reveals the presence of ITC.

Majority of benign disease of the thyroid is managed non-operatively.<sup>2</sup> Current literature reports an incidence of ITC varying between 10 to 20%.<sup>3,4</sup> The prevalence of goiter in Sri Lanka is about 6.8%.<sup>5</sup>

A previous study at the same unit which included patients with AIT had shown an incidence of ITC as 8.8%.<sup>5</sup> Hence, the current study was undertaken with the exclusion of patients with AIT which is a well-known risk factor for the development of carcinoma of the thyroid.

Presence of ITC in approximately 1/10 patients with benign disease warrants re-evaluation of options in the management of BTD.

## MATERIALS AND METHODS

This prospective cohort study was conducted from November 2002 to October 2015. All consenting patients who underwent total thyroidectomy for BTD at the professorial surgical unit, NCTH were included in the study.

Clinical, biochemical, radiological (USS) and cytological (FNAC) assessment was done pre-operatively in all patients.

Clinical and radiological features of the goiter were used to categorize participants as having a multinodular goiter (MNG), solitary thyroid nodule (STN) or diffuse goiter. Biochemical assessment of the thyroid status grouped them to be hyperthyroid (<0.4 mU/L), euthyroid (0.4-4.0 mU/L) and hypothyroid (>4.0 mU/L). All patients were made euthyroid before surgery.

Preoperative cytological findings of Thy 2 was taken as the inclusion criterion. Other cytological types, including carcinoma of the thyroid and the presence of autoimmune thyroiditis, were taken as exclusion criteria.<sup>6</sup>

All surgeries were performed by a single surgeon at a professorial surgical unit of NCTH. Total thyroidectomies were performed through a standard collar incision

with capsular dissection. Nerve encountering (Recurrent laryngeal nerve/ external branch of superior laryngeal nerve) and parathyroid preservation, auto-transplantation techniques were adhered to routinely. Completion thyroidectomies were done for solitary thyroid nodules.

Analysis of the pre and post-operative cytological and histopathological assessments was performed by the Department of Pathology, University of Kelaniya, Sri Lanka.

Characteristics of preoperatively the two goiters which showed malignancy in post-operative histology (n = 19); were compared using Fisher's exact test using SPSS software, version 20.

Ethical approval was granted by the Ethics Review Committee of Faculty of Medicine, University of Kelaniya, Sri Lanka.

## RESULTS

A total of 167 patients were included in the study. ITC was noted in 19 patients (Table 1). The median age was 41.21 years in females and 37.4 years in males with a range of 28 to 62 years. The incidence of ITC was 11.38%.

Clinical features of the 19 ITC patients showed 14 MNGs (73.68%), 4 STNs (21.05%) and one diffuse goiter (5.26%). None of the lesions were detected clinically. Morphology and ITC did not show any significant association (MNG  $p = 0.139$ , STN  $p = 0.089$ )

Biochemical assessment of the ITC population revealed 14 patients were euthyroid (73.68%) and five were hyperthyroid (26.31%). None were hypothyroid. Preoperative thyroid status did not show any significant association to the occurrence of ITC (Euthyroid  $p = 0.545$ , Hyperthyroid  $p = 0.331$ )

Postoperative histopathological findings showed 12 papillary carcinomas (63.15%) and seven follicular carcinomas (36.85%). Medullary carcinoma was not detected. All histologically detected lesions were less than 2 cm.

## DISCUSSION

The worldwide prevalence of ITC is about 10 to 20% according to the literature.<sup>3,4</sup> Issues and concerns regarding ITC has not been adequately addressed in the literature. Neighbouring India had recorded a prevalence of 20.3%.<sup>4</sup> The prevalence is likely to be higher as some individuals with goiter may not present to a medical facility.<sup>7</sup> The incidence of ITC in this cohort is 11.38%. This

incidence is higher than previously recorded (8.8%).<sup>5</sup> It is worthwhile noting that the prevalence of goiter in Sri Lanka is 6.8%.<sup>8</sup>

On analysis, MNG or STN had no significant association with ITC in this study. Current literature is in line with these findings.<sup>9</sup> Biochemical status of the thyroid did not yield any significant association with the occurrence of ITC. Most were euthyroid. Other studies including a meta-analysis by Negro et al. in 2013 showed no significant relationship between low TSH (hyperthyroid) and incidental carcinoma of the thyroid.<sup>10</sup>

Post-operative histopathological diagnoses showed the dominant histological type of ITC as papillary carcinoma. This is in accordance with the current literature.<sup>11</sup> Follicular carcinomas were found in 36.85% in this study. ITC with follicular histology was noted in a range of 16 to 42% by several authors.<sup>4,12</sup>

Most patients with BTD do not undergo surgery in the current setting.<sup>2</sup> Total thyroidectomy for BTD has gained popularity over the years.<sup>13</sup> The complications associated with total thyroidectomy are minimal in experienced hands.<sup>14-16</sup> Friguglietti et al. noted that the common complications of transitory/permanent hypoparathyroidism, hematoma requiring surgical intervention or transitory/permanent RLN damage are not significantly higher in total thyroidectomy than in a sub-total procedure.<sup>14</sup> Consideration of total thyroidectomy for BTD should be re-evaluated, especially in long-standing MNG where there is a risk of malignancy.<sup>17,18</sup> An incidence of 11.38% in ITC and the difficulties in reoperation favors the use of total thyroidectomy in BTD.<sup>16</sup>

## CONCLUSION

The incidence of ITC is 11.38% in this cohort. The incidence of ITC being approximately 1:10 emphasizes the need to consider total thyroidectomy in the management of BTD.

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**Table 1:** Gender distribution of the cohort

	BTB	ITC	Total
Male	15 (8.98%)	5 (2.99%)	20 (11.98%)
Female	133 (79.64%)	14 (8.38%)	147 (88.02%)
Total	148 (88.62%)	19 (11.37%)	167

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