

# Incidence of intrathyroid location of parathyroid glands and description of their characteristics compared to extrathyroid ones

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## OBJECTIVES

Total thyroidectomy (TT) is a safe and effective operation. The most frequent complication after TT is hypoparathyroidism. Surgical trauma, devascularization of parathyroid glands and inadvertent parathyroidectomy have been identified as the main causes resulting in postoperative hypocalcaemia. The objectives of this study are:

1. To investigate the incidence of intrathyroid parathyroid glands (ITPGs) in a large cohort
2. To clarify their histological characteristics.

## METHODS

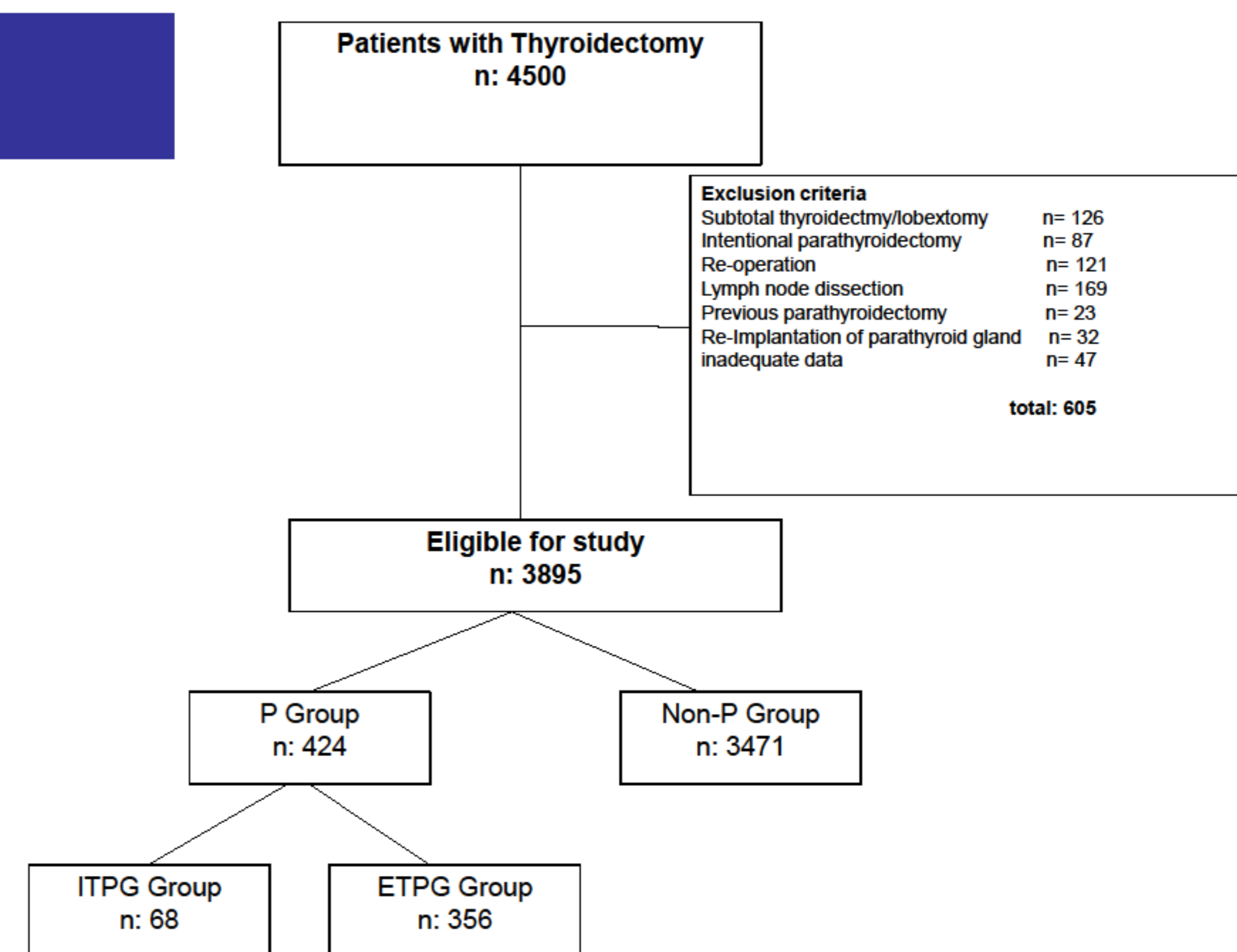
This is a retrospective study of two specialized centers in thyroid diseases. The medical records of patients with thyroidectomy were reviewed. Clinical and demographic characteristics, biochemical results, information regarding operation and histopathological data were routinely collected. Figure 1 show the flow diagram of the study and the exclusion criteria. Patients were divided into two groups: those with parathyroidectomy (P group) and those without parathyroidectomy (non-P group). According to the location of the dissected parathyroid gland the P-group was sub-divided in ITPGs or extrathyroid parathyroid glands (ETPGs). As ITPG we term the parathyroid gland that is completely surrounding by thyroid tissue or is intracapsular without separate capsule from the thyroid gland Morphological characteristics of ITPGs were compared with the corresponding characteristics of the ETPGs in a case control way.

## Graphs and tables

Table 1

Patient characteristics	P group (n=424)	Non-P group (n=3471)	Total (n=3895)	p <sup>^</sup>
Age (y), mean [SD]	52.44 [22.61]	53.75 [19.6]	53.5 [20.57]	n/s
Gender n (%)	M 93 (22) F 331 (78)	M 729 (21.1) F 2742 (78.9)	M 837(21.49) F 3058(78.51)	n/s
Operative time (min), mean [SD]	87.43 (13.4)	84.35 (15.32)	85.7 (14.45)	n/s
Thyroid gland weight (gr), mean [SD]	45 [28.3]	51 [43.4]	47[39.8]	0.18
Diagnosis, n (%)				
Benign thyroid diseases	275 (64,86)	2492 (71.8)	2767 (71)	n/s
Malignant thyroid diseases	149 (35.14)	979 (28.2)	1128 (29)	<b>0.04</b>
Transient hypocalcemia n (%)	72 (17)	520 (14.9)	592 (15.2)	n/s
Permanemt hypocalcicemia (%)	3 (0.7)	2 (0.06)	5 (0.13)	<b>0.001</b>
Hospital stay (days), mean [SD]	1.5 (0.35)	1.4 (0.4)	1.4 (0.45)	n/s

Figure 1  
Flow diagram



## RESULTS

4500 patients with TT were included. 605 of them were excluded from the study. Inadvertent parathyroidectomy (IP) was presented in 424 cases (10.89%). The number of parathyroid gland removal ranged from 1 to 4 (median 1). **Table 1** present patient's characteristics. IP was more frequent in patients operated for malignant thyroid diseases compare to those with benign thyroid diseases (*15.2% and 11% respectively p=0.04*). Intrathyroid parathyroid glands were presented in 68 cases (1.75%). ITPGs did non differ as for the patients characteristics with ETPGs (**Table 2**). **Table 3** describe ITPGs features. There was a trend of ITPGs being smaller in size compared to ETPGs (*p=0.067*). Cystic degeneration was presented in ITPGs (*p=0.01*). Other histological characteristics, including weight were similar in intra and extra parathyroid glands. Presence of clinical hypocalcaemia was similar in all groups.

Table 2

Patient characteristics	ITPG group (n=68)	ETPG group (n=356)	p <sup>^</sup>
Age (y), mean [SD]	51.9 [21.4]	52.8 [23.1]	n/s
Gender n (%)	M 15 (22) F 53 (78)	M 78 (21.9) F 278 (78.1)	n/s
Operative time (min), mean [SD]	85.4 [18]	88.7 [16.5]	n/s
Thyroid gland weight (gr), mean [SD]	43 [29.8]	46 [26.3]	n/s
Diagnosis, n (%)			
Benign thyroid diseases	25 (36.76)	125 (35.1)	n/s
Malignant thyroid diseases			
Number of parathyroid removal median (range)	1 (1-3)	1 (1-4)	n/s
Transient hypocalcemia n (%)	12 (17.6)	60 (16.85)	n/s
Permanemt hypocalcicemia (%)	1	2	n/s
Hospital stay (days), mean [SD]	1.5 [0.3]	1.5 [0.4]	n/s

Table 3

Parathyroid characteristics	ITPG group (n=68)	ETPG group (n=356)	p <sup>^</sup>
Size (mm), mean [SD]	2.8 [1.6]	3.2[1.9]	n/s
Weight (mg), mean [SD]	35 [18]	41[13]	n/s
Partial parathyroid gland n (%)	7 (10.3)	89 (25)	<b>0.001</b>
Intact parathyroid gland n (%)	61 (89.7)	267 (75)	
Hyperplasia	1 (1.47)	3 (0.88)	n/s
Cystic degeneration n (%)	3 (4.5)	1 (0.28)	<b>0.001</b>
Number of parathyroid removal median (range)	1 (1-3)	1 (1-4)	n/s

## CONCLUSIONS

- ❑ The incidence of ITPGs in our cohort is 1.75%.
- ❑ Surgical removal of ITPGs does not increase the presence of clinical hypocalcaemia and should be consider a minor complication of TT.
- ❑ Patients should be informed prior to TT about the possible presence of ITPGs and, therefore, their probable accidental removal.

## References

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