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An Analysis of Early and Delayed Operation for Graves' disease : a Retrospective cohort study

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Introduction

- In Graves' disease patients, surgical intervention has advantages than other treatments in terms of rapid therapeutic effect and lower risk of relapse.
- However, the surgical treatment is typically recommended as a last option for Graves' disease.
- There is little information about surgical outcomes in patients with Graves' disease.
- The aim of this study was to evaluate clinical and surgical outcomes according to timing of the surgery.

Materials and Methods

1. Patients

- Retrospective study
- From January 2018 to December 2023
- Seoul National University Hospital
- Graves' disease
- Patient demographics : sex, age, BMI and Interval between diagnosis and surgery

2. Methods

- Devided into 2 groups : based on the interval between initial diagnosis and surgery (18 months)
  - Early operation(op) group vs. delayed op group
- Surgical indication
- Preoperative and postoperative laboratory finding :
  - T4, TSH, TSH R-Ab
- Surgical outcome : operation time, estimated blood loss (EBL), thyroid weight and postoperative complication

Results

- Table 1. Patients characteristics

Variables	Total (n=180)
Interval between initial diagnosis and surgery (years)	
Early operation group	55 (30.6%)
Delay operation group	125 (69.4%)
Sex (n, %)	
Female	142 (78.9%)
Male	38 (21.1%)
Age (years, mean ± SD)	40.1 ± 16.7 [6-80]
BMI (kg/m^2, mean ± SD)	23.5 ± 4.0 [15-37]
Thyroid weight (g)	96.6 ± 84.6 [11.9-515.0]
Thyroid volume (ml)	123.9 ± 100.5 [10.9-603.9]
Operation time (min)	
Open	124.1 ± 47.5 [40.0-288.0]
Robot	196.6 ± 80.6 [105.0-410.0]
Postoperative hospital stay (days)	3.75 ± 1.3 [2-10]

- Table 2. Surgical indication in early and delayed operation groups

Indication for surgery	Early op (≤ 18m)	Delayed op (> 18m)
Large goiter (≥ 80g)	14 (25.5%)	37 (29.6%)
Resistant to antithyroid drug (ATD)	9 (16.4%)	49 (39.2%)
Relapse of disease	6 (10.9%)	9 (7.2%)
ATD toxicity	8 (14.5%)	4 (3.2%)
Nodule required for operation	24 (43.6%)	23 (18.4%)
Severe orbitopathy	5 (9.6%)	20 (16.0%)
Cardiovascular comorbidities	4 (7.3%)	5 (4.0%)
Thyroid storm	0 (0.0%)	1 (0.8%)
Planned Pregnancy	0 (0.0%)	5 (4.0%)
ETC	1 (1.8%)	5 (4.0%)
Poor compliance to ATD	0 (0.0%)	2 (1.6%)
Psychiatric disease	1 (1.8%)	0 (0.0%)
Preference for surgery	0 (0.0%)	3 (2.4%)

- Table 3. Comparison of characteristics between early and delayed operation groups

Variables	Early op (≤ 18m)	Delayed op (> 18m)	p-value
Interval from diagnosis to surgery (months)	11.0± 3.2 [0-12]	94.4± 58.4 [24-360]	<0.001
Age (years)	41.5± 16.2	39.5 ± 17.0	0.226
Age at initial diagnosis (years)	38.6 ± 16.0	29.8 ± 15.8	<0.001
BMI (kg/m^2)	24.0 ± 3.9	23.3 ± 4.0	0.146
Methimazole daily dose (mg)	12.6 ± 10.7	14.6 ± 10.8	0.361
Operation time (min)			
Open	116.8 ± 49.8	127.0 ± 46.5	0.109
Robot	183.0 ± 48.2	209.3 ± 103.0	0.260
Thyroid Volume (ml)	89.7 ± 79.0	139.0 ± 105.4	<0.001
Thyroid Weight (g)	69.0 ± 65.5	108.7 ± 89.3	<0.001
Thyroid weight			
< 80g	38 (69.1%)	64 (51.2%)	0.026
≥ 80g	17 (30.9%)	61 (48.8%)	
EBL(ml)	85.0 ± 59.2	122.9 ± 144.8	0.020
Postoperative T4 (ng/dL)	1.31 ± 0.3	1.22 ± 0.3	0.037
Postoperative TSH (uIU/ml)	3.95 ± 19.4	5.59 ± 18.1	0.301
Postoperative TSH R-Ab (IU/L)	6.97 ± 18.7	12.3 ± 48.4	0.249
Postoperative hospital stay (days)	6.82 ± 3.8	6.62 ± 3.4	0.361
Complication			
None	35 (63.6%)	77 (61.6%)	0.157
Yes	20 (36.4%)	48 (38.4%)	

- Table 4. Postoperative complication

Postoperative complication	Total (n=180)	Early op (≤ 18m)	Delayed op (> 18m)	p-value
Transient recurrent laryngeal nerve palsy	6 (3.0%)	2 (3.6%)	4 (3.2%)	0.907
Permanent recurrent laryngeal nerve palsy	1 (0.6%)	1 (1.8%)	0 (0.0%)	n/a
Transient hypoparathyroidism	50 (27.9%)	16 (29.1%)	34 (27.2%)	0.992
Permanent hypoparathyroidism	10 (5.6%)	2 (3.6%)	8 (6.4%)	0.578
Bleeding	3 (1.7%)	0 (0.0%)	3 (2.4%)	n/a
Wound infection	0 (0.0%)	0 (0.0%)	0 (0.0%)	n/a
Chyle leakage	0 (0.0%)	0 (0.0%)	0 (0.0%)	n/a
Trachea injury	0 (0.0%)	0 (0.0%)	0 (0.0%)	n/a

Discussion

- The most common indication for surgery was thyroid nodule in the early operation group, while resistant to antithyroid drug was most in the delayed operation group.
- There was the significant differences in EBL, thyroid volume and thyroid weight between the early operation and delayed operation group.
- There was no significant differences in operation time and hospitalization days and postoperative complications between two groups, which might be attributed to the operation conducted by the experienced physicians in a tertiary hospital.

Conclusion

- Based on the results, **early operation could be necessary** for Graves' disease with thyroid goiter of considerable size.
- Further studies are needed to analyze clinical outcomes over time and establish the optimal surgical timing for Graves' disease.

References

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- 2. Bojic T et al. Total thyroidectomy as a method of choice in the treatment of Graves' disease - analysis of 1432 patients. BMC Surg. 2015;15:39.