



# The effect of parathyroid gland reimplantation during thyroidectomy on post-thyroidectomy hypoparathyroidism

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Introduction	Material and Methods
<ul style="list-style-type: none"> <li>Hypoparathyroidism - a common complication following bilateral thyroid surgery</li> <li>Secondary to ischemia/devascularisation of parathyroid glands</li> <li>Parathyroid gland re-implantation - effective technique to preserve parathyroid gland function</li> </ul> <p style="text-align: center;"><b>Aim</b></p> <ul style="list-style-type: none"> <li>To assess the effect of parathyroid gland reimplantation during bilateral thyroid surgery on the rates of temporary and permanent hypoparathyroidism</li> </ul>	<ul style="list-style-type: none"> <li>Single center, Retrospective study</li> <li>Study period: January 2017 to June 2022</li> <li>Inclusion - Consecutive patients who underwent bilateral thyroid surgery with or without cervical node dissection</li> <li>Technique - selective parathyroid gland re-implantation</li> <li>Postoperative measurement of serum calcium and PTH performed on the day of surgery</li> <li>Cohort of patients who underwent parathyroid reimplantation compared with those who did not undergo reimplantation</li> <li>Data analysed using the SPSS (Statistical Package for the Social Sciences) software (21.0)</li> </ul>

**Definitions**

a) *Immediate post-operative hypoparathyroidism* - Same day post-operative PTH < 1.6pmol/L  
 b) *Temporary hypoparathyroidism* - Immediate post-operative hypoparathyroidism which recovers within 6 months of surgery  
 c) *Permanent hypoparathyroidism* - Immediate post-operative hypoparathyroidism which fails to recover 6 months following surgery

Variable	n (%)		Parathyroid reimplantation	Post operative PTH		
				< 1.6pmol/L	≥ 1.6pmol/L	
Total patients	192		<b>Yes (%)</b>	61 (43.3%)	80 (56.7%)	P=0.006
Mean Age (range)	52.8 (13-89) years		<b>No (%)</b>	11 (21.6%)	40 (78.4%)	
Gender (F:M)	149:43		<b>Number of glands reimplanted</b>	<b>Post operative PTH</b>		P<0.001
Histopathology	Benign	126 (65.6%)		< 1.6pmol/L	≥ 1.6pmol/L	
	Malignant	66 (34.4%)	<b>0</b>	11 (21.6%)	40 (78.4%)	
Operation performed	TT	125 (65.1%)	<b>1</b>	22 (31.9%)	47 (68.1%)	P=0.35
	TT + U/L CCLND	19 (9.9%)	<b>2</b>	21 (44.7%)	26 (55.3%)	
	TT + B/L CCLND	17 (8.9%)	<b>3</b>	17 (70.8%)	7 (29.2%)	
	TT + SLND	14 (7.3%)	<b>4</b>	1 (100%)	0 (0%)	
	Completion thyroidecomy	15 (7.8%)	<b>Parathyroid reimplantation status</b>	<b>Days to normalise parathyroid function - Median (IQR)</b>		
	Tracheal resection	2 (1%)	<b>Reimplanted</b>	17 (10,35.5)		
<b>Parathyroid re-implantation</b>	<b>141 (73.4%)</b>		<b>Not reimplanted</b>	25 (11,48)		P=0.14
<b>Hypoparathyroidism</b>	<b>Temporary</b>	<b>70 (36.6%)</b>	<b>Number of parathyroid glands reimplanted</b>	<b>Days to recovery of parathyroid function - Median (IQR)</b>		
	<b>Permanent*</b>	<b>2 (1%)</b>	<b>0</b>	25 (11,48)		
			<b>1</b>	12 (6,30)		
			<b>2</b>	24 (13,40)		
			<b>3</b>	14 (6,60.5)		
			<b>4</b>	40 (40,40)		

\*In both patients who developed permanent hypoparathyroidism, parathyroid glands were not re-implanted

**Conclusion**

- Parathyroid gland reimplantation was significantly associated with an increased rate of temporary hypoparathyroidism (p=0.006)
- The number of parathyroid glands re-implanted significantly affects the rate of temporary hypoparathyroidism (p<0.001)
- However, this result should not be interpreted that parathyroid reimplantation causes temporary hypoparathyroidism, rather, that patients who have more devascularised glands were selected to have more transplants, and are at higher risk of temporary hypoparathyroidism, regardless of whether the glands had been left in situ or transplanted
- Comparison of the rates of permanent hypoparathyroidism could not be performed due to insufficient sample size and events
- Recovery of parathyroid gland function occurred within 4 weeks in the majority
- The rate of recovery did not depend upon re-implantation (p=0.35) nor on the number of glands reimplanted (p=0.14)