

Contents

Foreword 1 by Hiroshi Takagi	iii
Foreword 2 by Henry Johansson	v
Intoroduction—Surgery for hyperparathyroidism focusing on SHPT by Yoshihiro Tominaga	vii
Acknowledgement	ix
Author's profile	x
Abbreviations	xv
Chapter 1. History of parathyroid gland	1
Chapter 2. Embryology and anatomy of parathyroid gland	5
2.1. Embryology	5
2.2. Anatomy	5
Chapter 3. Pathology of parathyroid gland	9
3.1. Normal structure of parathyroid gland	9
3.2. Hyperplasia in primary hyperparathyroidism (PHPT)	10
3.3. Hyperplasia in secondary hyperparathyroidism (SHPT)	10
3.4. Parathyroid adenoma	10
3.5. Parathyroid carcinoma	10
Chapter 4. Definition of hyperparathyroidism	13
Chapter 5. Pathophysiology	15
5.1. Calcium homeostasis	15
5.2. Phosphate homeostasis	15
5.3. Pathophysiology of SHPT	15
Chapter 6. Parathyroid cell proliferation and tumorigenesis in SHPT	17
Chapter 7. Epidemiology and background of SHPT	23
7.1. Epidemiology	23
7.2. Frequency of PTx for SHPT	25
Chapter 8. Clinical manifestations of SHPT	29
8.1. Symptoms	29

8.2.	Manifestations of renal osteodystrophy (ROD)	29
8.3.	Ectopic calcification	31
8.4.	Laboratory findings	32
Chapter 9.	Preoperative image diagnosis	35
Chapter 10.	Treatment for SHPT	37
10.1.	Medical treatment	37
10.2.	Intervention therapy	38
10.3.	Surgical indications	38
10.4.	Surgical management	40
10.5.	Preoperative management	41
10.6.	Our surgical procedure	42
10.7.	An algorithm to identify parathyroid glands	46
10.8.	Surgical topics	48
10.8.1.	Intraoperative monitoring of PTH levels (IOPTH monitoring)	48
10.8.2.	Intraoperative neural monitoring (IONM)	49
Chapter 11.	Postoperative management	51
Chapter 12.	Outcomes of PTx for SHPT	53
12.1.	Number of parathyroid glands and total glandular weight	53
12.2.	Clinical improvement after PTx	53
12.3.	Function of parathyroid autografts	56
12.4.	Thyroid lesions in SHPT	57
Chapter 13.	Persistent and recurrent SHPT	59
13.1.	Definition	59
13.2.	Graft-dependent recurrent SHPT	59
13.3.	Persistent SHPT and detection of missed parathyroid glands	60
13.4.	Ectopic and supernumerary parathyroid glands	61
13.4.1.	Thymic tongue	62
13.4.2.	Mediastinal parathyroid glands	63
13.4.3.	Undescended parathyroid glands	64
13.4.4.	Intrathyroidal parathyroid glands	64
13.4.5.	Parathyroid glands around Berry's ligament	66

13.5. Parathyromatosis	66
13.6. Parathyroid carcinoma in SHPT	67
13.7. Spontaneous remission of hyperparathyroidism	70
Chapter 14. Tertiary hyperparathyroidism (THPT)	75
14.1. Pathophysiology of THPT	75
14.2. Surgical indications and timing of PTx	75
14.3. PTx for THPT	76
14.4. Benefits of PTx for THPT	77
Chapter 15. Primary hyperparathyroidism (PHPT)	79
15.1. Prevalence and classification	79
15.2. Clinical diagnosis	79
15.3. Surgical indication	80
15.4. PTx for PHPT	80
15.5. Our operative procedure for PHPT	82
15.6. Selection of operative procedure	83
15.6.1. Parathyroid carcinoma	83
15.6.2. Double adenomas	83
15.6.3. Non-familial parathyroid hyperplasia	84
15.6.4. MEN types 1 and 2A	84
15.7. Clinical advantages of PTx	84
15.8. Medical treatment for PHPT	84
Chapter 16. Surgical treatment of hyperparathyroidism in the future	87
Our published papers concerning with parathyroid gland	89
Postscript	97
Index	98