

Research Article

Post Thyroidectomy Hypoparathyroidism: Our 14 Years Experience

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Abstract

Objective:- To assess the adequacy of our current management of Permanent Hypoparathyroidism using Calcium and Vit, D3 supplements and life long follow up.

Methods:- All patients of Permanent Hypoparathyroidism after total thyroidectomy were enrolled. Clinical history, Physical Examination was recorded, Laboratory investigations decided in the study protocol were done periodically, every three month during follow up. All cases were treated with conventional Calcium and Vit, D3 therapy.

Results:- We studied 22 cases. Three cases were our own and 19 cases were operated at other institutions. Ages ranged from 20 - 58 years. Only three cases were male. We needed to adjust the Vit D3 and Calcium dose quite often. In our cases of thyroidectomy the incidence was 2.04%. There was no significant difference of incidence among various thyroid pathology groups. All patients were satisfied and no disease complication was detected during follow up.

Conclusion:- Therapy for Permanent Hypoparathyroidism with Calcium and Vit D3 is adequate. Use of PTH (1-84) seems more physiological but needs daily subcutaneous injection. In future its oral preparation will revolutionize the management. For normal quality of life we need life time follow up.

Received | 15-01-2020: Accepted | 28-03-2020

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Keywords: Hypoparathyroidism, Thyroid, Post thyroidectomy

Introduction

Nearly 75% of Hypoparathyroidism cases are due to thyroid surgery for its different pathologies⁽¹⁾. Other rare causes are primary disorder, autoimmune disorders or metastatic disease replacing the normal tissue.

This disease is known since the first documented thyroidectomy by Pierre Joseph Desault in 1791 even when the physiology of parathyroid gland was not very clear.²

Though Kocher's technique made the procedure very safe yet the incidence as high as 30-50% of transient

hypoparathyroidism is reported in the literature after total thyroidectomy.³

Mostly there is recovery of gland function maximally in 6 months time reducing the incidence of Permanent Hypoparathyroidism in the range of 2-3%.³

This disease entity should be handled as seriously as any other endocrine deficiency disorder. All cases need good clinical evaluation and laboratory investigations. At present we treat it with the use of calcium and Vit D3 supplements not forgetting the life long follow up.^{4,5,6}

We come across all grades of deficiency affecting nearly all body systems, starting from acute hypocalcaemia resulting in tetany to chronic symptoms of muscle cramps, lethargy insomnia, bone aches, brain fog etc.⁷

During the last 14 years at this institution we collected 22 cases of Permanent Hypoparathyroidism operated at ours and at other hospitals. After making the diagnosis we booked them for treatment and follow up in accordance with our prospective study protocol. Luckily the patients co-operated well and we had good follow up record.

In the following study we are going to present our experience and review of the literature.

Methods

Patients were picked up on the basis of the clinical presentation, history of previous surgery and the treatment they were receiving. All our total thyroidectomy cases in their post operative period had intravenous calcium 10% 10cc 6 hourly for two days followed by oral calcium preparation for 2-3 weeks till serum PTH results were received and found normal (more than 12-15 pg/ml) when the calcium supplement was tapered off. If the PTH results were suggesting poor function of gland supplement therapy continued. Patients operated at other institutions were receiving the same treatment but surprisingly a good number of them were receiving inadequate replacement of calcium. They were complaining of muscular cramps, bone pain, depression and insomnia. No one presented with tetany.

Presentation like cataract, intrarenal calcification, reduction of glomerular filtration rate, soft tissue calcification were neither seen at the time of first visit nor during follow up period. Initially the following investigations were done.

- 1- Serum total and ionized calcium
- 2- Serum phosphorus, Manganese and Albumin
- 3- Serum PTH
- 4- Blood urea, Serum Creatinin
- 5- 24 hours urinary calcium
- 6- Vit D3 assay.

Radiological and other investigations were done selectively and rarely. They contribute very little in

early cases.

Patients were told to visit after every three months or anytime for bothering symptoms. The investigations were repeated every three months and when serum PTH is found normal the calcium supplements were tapered off and patients were taken off the study because we included in the study only the cases of Permanent Hypoparathyroidism. Then onward the cases turning up for follow up went through clinical examination, laboratory investigations like serum calcium, serum phosphorus, Vit D3 assay, 24 hours urine Calcium every three months. Calcium and Vit D3 doses were adjusted as required.

Results

We collected 22 cases of Permanent Hypoparathyroidism including our own three cases. Only three cases were male. Ages ranged between 20 - 58 years.

Incidence of Permanent Hypoparathyroidism in different thyroid pathology groups who underwent total thyroidectomy in our hospital is recorded in table 1.

The figures are small and one cannot conclude that any group has any significant higher incidence. All we can say is that repeat surgery is more risk.

19 cases were from other institutions and their pathology groups are recorded in table 2.

All cases received the conventional Calcium supplement therapy. We needed to adjust the dose during the

Table 1: Incidence of Permanent Hypoparathyroidism in different Pathology Groups of our 147 Cases of Total Thyroidectomies

Sr No	Thyroid Pathology	No Of Cases	Permanent Hypoparathyroidism	%
1	Completion thyroidectomy for malignancy	27	1	3.7
2	Toxic M N G	51	1	1.98
3	M N G	41	1	2.44
4	Cold Nodule (Bethesda 4)	28	0	0

follow up.

No case was found refractory to our management. The patients remained symptom free and satisfied.

No musculoskeletal, neurological, or renal complications were noted.

Table 2: *Thyroid Pathologies of 19 Cases of Permanent Hypoparathyroidism from other Institutions*

Sr No	Thyroid Pathology	No Of Cases
1	M N G	3
2	Toxic M N G	5
3	Completion thyroidectomy for neoplasm	6
4	Thyroidectomy for cold nodule	5

Serum Calcium, Phosphorus and Vit, D3 Levels fluctuated occasionally resulting in minor musculoskeletal and neurological symptoms. This required dose adjustment.

Discussion

Parathyroid hormone control calcium homeostasis. When there is loss of all parathyroid glands during total or subtotal thyroidectomy patient suffer from parathyroid hormone deficiency. Serum calcium drops down and presents with tetany requiring immediate correction with intravenous calcium replacement. Later on this deficiency disorder has to be constantly controlled with calcium and calcitriol supplements.

For this hypoparathyroidism state the best and physiological replacement is the parathyroid hormone extract which was first recommended by Fuller Albright in 1929.²

The incidence of hypoparathyroidism is 20-30% immediate after surgery. Unless all the glands have been inadvertently removed there is good chance of recovery of glandular function and in the literature the incidence of Permanent Hypoparathyroidism is reported 1.5 - 2%(1,4),

The glands might be removed with the lobes during difficult dissection or they might suffer from ischemia because they share the blood supply with thyroid. Long exposure, messy dissection or desperate attempt to identify them can result in ischemia which will at least result in transient Hypoparathyroidism. We find it more often in case of advanced malignancy, thyroiditis (Riedel,s) or reoperations (completion thyroidectomy).^{4,16,17}

Acute presentation of hypoparathyroidism soon after

operation (stunning of gland) is tetany. It is recommended that all cases of total and subtotal thyroidectomy should receive calcium gluconate 10% 10cc 6-8 hourly for 2-3 days. Later on switching to oral calcium and calcitriol supplements till we receive the results of PTH assay,

The period of gland recovery usually extends upto 6 months, in some series even upto a year.^{5,7}

Among the different indications of total thyroidectomy there is nearly no difference of incidence of Permanent Hypoparathyroidism although transient Hypoparathyroidism is more in cases of malignancy and thyroiditis.^{8,9}

Many a times we are tempted to save a wafer of tissue (Subtotal thyroidectomy). This operation has low incidence of transient hypoparathyroidism but the incidence of Permanent Hypoparathyroidism is equal to total thyroidectomy⁽⁹⁾.

Technique is the most important factor because in the hands of endocrine surgeons and groups presenting large series the incidence is 1 - 1.5%.^{8,10}

Prolonged exposure of gland result in hypothermia and ischaemia of gland.⁹

Implantation of detached parathyroid although has same incidence of transient hormone deficiency but it is helpful in preventing permanent loss.¹⁰

Prolonged and tedious dissection to indentify parathyroid glands in orthotopic position adversely affects the transient Hypoparathyroidism and result in prolonged recovery (resolution of function).^{8,12}

The only independent risk factor for Permanent Hypoparathyroidism is the presence of parathyroid glands in the pathology specimen.^{8,9}

Low preoperative PTH, low Vit D level, hypoalbumenemia are risk factors for transient Hypoparathyroidism.⁹

Age, gender, thyroid pathology do not influence the incidence of Permanent deficiency.^{9,10}

Use of 8mg of dexamethasone pre operatively or during anaesthesia reduces the incidence of acute hypocalcemia and tetany.¹¹

Like any other endocrine deficiency disorders this too

need life long follow up to ensure accurate management and prevention of any irreversible pathology and enjoy normal quality of life.¹⁴ With our conventional calcium and Vit D3 therapy we managed to take care of all our patients. For hypercalcaemia we used thiazid diuretics. Monitoring of phosphate products is important.^{9,12,14}

Similarly high doses of calcitriol should be avoided.¹⁴ Dietary intake of phosphates should be reduced. Use of phosphate binders is helpful.¹⁴

Calcium phosphate products should remain <4.4 mmol/L.^{12,14}

Looking forward, we admit that use of PTH extract will replace the present management. It will take care of all systems with natural automatism.¹⁵

Recent interest in the research of PTH (1 - 84) and its clinical use is our future hope. We wait for its convenient oral preparation. Now available PTH (1-84) is subcutaneous injection used daily or every other day.¹⁵

Our 22 cases experience though very small yet long follow up (18 cases followed for 12 years). give us confidence in the use of our conventional supplement therapy.

Ethical Approval: Given

Conflict of Interest: The authors declare no conflict of interest

Funding Source: None

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