INTRODUCTION

Parathyroid carcinoma is a rare tumour of the parathyroid glands. There is significant overlap between the presentation, diagnosis and management of parathyroid carcinoma and the far more common parathyroid adenoma causing hypercalcaemia/hyperparathyroidism. ¹

The following discussion will encompass diagnostic and management issues for both parathyroid adenomas and carcinomas.

1. PREVENTION & SCREENING

This step discusses the screening of patients who possibly harbor undiagnosed hyperparathyroidism, the impact and potential benefits of early diagnosis and treatment.

Primary Hyperparathyroidism is one of the most common causes of hypercalcaemia. The prevalence is estimated to be as high as 2% of menopausal women. ²

Untreated primary hyperparathyroidism has a number of deleterious systemic manifestations. This includes effects on the renal, musculoskeletal, neuropsychiatric, gastrointestinal, and cardiovascular systems. There is evidence also indicate an increase in overall mortality with untreated hyperparathyroidism.³

Surgery for hyperparathyroidism corrects the morbidity from these systemic manifestations and also improves quality of life.⁴

Although there are not accepted population based screening protocols for hyperparathyroidism, there are certain clinical scenarios which should alert clinicians to the possibility of hyperparathyroidism and consider screening serum biochemistry. This is discussed in the following section.

Screening serum biochemistry should consist of serum Calcium (total /ionised) and parathyroid hormone level. These must be performed on the same blood sample.

2. INITIAL PRESENTATION

Clinical scenarios where screening serum biochemistry should be performed.

The following clinical situations scenarios should alert clinicians to the possibility of hyperparathyroidism and consider screening serum biochemistry.

- Osteoporosis on bone densitometry
- Bony changes in imaging suggestive of hyperparathyroidism
• Bone fractures
• Renal Calculi
• Nephrocalcinosis
• Idiopathic pancreatitis
• Refractory peptic ulcer disease
• Patients with psychiatric history
• Family history of primary hyperparathyroidism
• Investigation for lethargy or other vague complaints

Screening serum biochemistry should consist of serum Calcium (total/ionised) and parathyroid hormone level. These should be from the same blood sample.

3. DIAGNOSIS AND REFERRAL

This step defines the criteria for the diagnosis of primary hyperparathyroidism and subsequent investigations and referral.

3.1 DIAGNOSIS

The presence of an elevated serum calcium and concomitant elevated serum parathyroid hormone level confirms the diagnosis of primary hyperparathyroidism. Patients with parathyroid carcinoma classically have markedly elevated calcium, parathyroid hormone levels and a neck mass.

Other tests e.g. Vitamin D assays, Urinary calcium excretion, may be utilised to differentiate cases with borderline serum biochemistry. This is usually ordered by the endocrinologist or surgeon if further diagnostic clarification is required prior to treatment.

No further tests are required prior to referral for specialist management.

Many surgeons are performing minimally invasive/ minimal access parathyroidectomy. This requires the accurate preoperative localisation of the parathyroid adenoma. Localisation studies include sestamibi +/- SPECT and ultrasound scanning.5

Ultrasound scanning is also useful to identify any coincidental thyroid pathology.

Patients with family histories and/or multiple endocrine neoplasia syndromes may not be suitable for a minimally invasive approach due to the propensity for multiglandular disease.
3.2 REFERRAL

Patients with biochemically proven primary hyperparathyroidism should be referred to one of the following specialists.

- Endocrinologist
- Endocrine Surgeon
- General Surgeon with special interest in thyroid/parathyroid surgery
- ENT surgeon with special interest in thyroid/parathyroid surgery

4. ASSESSMENT & TREATMENT PLANNING

4.1 The multidisciplinary Team

The treating physician/surgeon should have access to an endocrine tumour multidisciplinary team. This allows a forum to review pathology and discuss difficult cases. The composition of the MDT comprises:

- Endocrinologist
- Endocrine Surgeons
- Pathologist
- Nuclear Medicine physician

5. TREATMENT

This step is concerned with the options of treatment, who will provide it, and where it should provided to ensure safe, high quality and effective care.

The mainstay of management of primary hyperparathyroidism/parathyroid adenoma/parathyroid carcinoma is surgical resection of the abnormal parathyroid gland or glands. En bloc resection of the ipsilateral hemic thyroid is the recommended surgical strategy for parathyroid carcinoma.1

Drugs can offer short term reductions in serum calcium levels. Calcimimetic agents have been developed to inhibit parathyroid cell function. These agents may have a greater role in hyperparathyroidism in the future.

5.1 SURGERY

In experienced hands, surgical excision of the parathyroid adenoma provides cure rates of between 97-99% 5. This can either be performed via bilateral neck exploration or a minimally invasive
approach. It is imperative that this surgery is performed by surgeons who are appropriately trained, experienced and credentialed for parathyroid surgery.

5.2 DRUG THERAPY

Drug therapy has a role in the short term control of hypercalcaemia and the management of patients considered too high risk for surgical intervention. These drugs include bisphosphonates, and Calcimimetic agents. Hormone replacement therapy and raloxifene provide some bone protection; however do not reduce serum calcium levels ⁶.

5.3 CONSERVATIVE MANAGEMENT

Large series have demonstrated the relative safety of surveillance of patients with mild hyperparathyroidism. However, one third of patients will develop worsening hyperparathyroidism during a 15 year period of follow up. Parathyroidectomy results in sustained increases in bone mineral density. Therefore there is increasing evidence to suggest that all patients with primary hyperparathyroidism should be offered surgical intervention⁷. Surveillance without surgical intervention requires serial blood biochemistry and bone mineral densitometry.

6. SURVEILLANCE & FOLLOW-UP CARE

*This step discusses the monitoring of patients after parathyroidectomy.*

There is a 2-3% rate of persistent hyperparathyroidism after surgery. This is due to either multiglandular disease, ectopic adenoma or a missed adenoma. The aim of monitoring is to identify the patients that have not had a curative parathyroidectomy.

The recommended follow up would consist of:

- Serum calcium and parathyroid hormone levels at
- 3 months post surgery
- 6 months post surgery
- 12 months post surgery

Should the 12 months post surgery result be normal, then no further follow up is indicated.

7. SURVIVORSHIP, RELAPSE AND RETREATMENT

Patients who develop recurrent parathyroid carcinoma should be discussed at the endocrine tumour MDT meeting.

8. RECOMMENDATIONS

- Screening calcium levels should be considered in certain clinical scenarios.
Patients with biochemically proven primary hyperparathyroidism should be referred for specialist management and offered surgical intervention.

All cases of parathyroid carcinoma should be discussed at an endocrine tumour MDT.

9. REFERENCES


4. Janice L. Pasieka, Louise Parsons, Jean Jones The long-term benefit of parathyroidectomy in primary hyperparathyroidism: A 10-year prospective surgical outcome study

