

Positional statement of the European Society of Endocrine Surgeons (ESES) on modern techniques in pHPT surgery

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Received: 18 June 2009 / Accepted: 18 June 2009 / Published online: 3 July 2009
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Keywords Primary hyperparathyroidism (pHPT) ·
Preoperative imaging · Intraoperative adjuncts · Surgery

Introduction

The second most frequent indication for intervention by an endocrine surgeon is primary hyperparathyroidism (pHPT), classically a bilateral neck exploration. It is more than 25 years since Sten Tibblin from Lund, Sweden proposed a unilateral surgical approach to pHPT, and in the last decade, even more changes—preoperative localisation procedures, intraoperative PTH assay, local anaesthesia, minimally invasive and short-stay surgery—have become available to ‘facilitate’ the treatment of the disease.

Are some/all of these techniques needed to improve outcome? Are they cost-effective?

These were the main questions discussed at the 2009 ESES workshop in Lund (March 19–21): *Modern Techniques in pHPT Surgery: An Evidence Based Perspective*.

In the year prior to the workshop, ESES pHPT working groups (*Preoperative Imaging, Intraoperative Adjuncts and Surgical Treatment*) reviewed the available literature within each respective field and graded the evidence for recommendations in accordance with accepted international standards. Draft manuscripts were prepared and published on the ESES homepage for members’ comments. At the

pHPT workshop, the recommendations were discussed in plenary sessions with input from the delegates.

The manuscripts were revised by the ESES working group committee. A decision was taken to publish a synopsis of the recommendations as a *positional statement of the ESES*.

Henning Dralle	Anders Bergenfelz
President	Chairman of the Organisation Committee
ESES	ESES pHPT workshop

Consensus statement ESES

Preoperative Imaging

First-time operation for primary hyperparathyroidism (pHPT)

(evidence at level III, recommendations grade B)

- Sestamibi (pinhole collimator, early/late acquisition) is the recommended first test, but ultrasound (US) by an experienced investigator (radiologist or surgeon) is an alternative and will also identify concomitant thyroid disease.
- The second test (sestamibi or ultrasound) is used to confirm the results of the first investigation.
- When concordant results are obtained, minimally invasive parathyroidectomy (MIP) can be recommended.
- If only one test is positive, the patient’s neck can be explored on the side indicated by the test (MIP or unilateral exploration) with the use of intraoperative PTH (iOPHT).
- If tests are not concordant, a bilateral neck exploration can be offered, or alternatively MIP or unilateral neck exploration with the use of iOPHT.

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- If both tests are negative, a bilateral neck exploration should be offered without the need for further imaging.
- Magnetic resonance imaging (MRI) or computed tomography (CT) is advised when a mediastinal lesion is seen on sestamibi. The anatomical detail provided by cross-sectional imaging will help the surgeon decide on the choice of surgical approach.

Reoperation for pHPT

(evidence at level IV, recommendations grade B)

- A repeat sestamibi scintigraphy is recommended. This should be performed by an experienced nuclear medicine team and when required, the scan should include the use of single photon emission computed tomography, subtraction, etc.
- Repeat US performed by an experienced investigator (radiologist or surgeon) has the potential to reveal enlarged parathyroid gland/s and is strongly recommended. Ultrasound-guided fine-needle aspiration with PTH measurement has excellent sensitivity and is recommended when an abnormality of uncertain nature is identified on US.
- If sestamibi scintigraphy and US are inconclusive, MRI and/or CT is recommended to confirm the findings of the other modalities.
- If sestamibi scintigraphy, US, CT, and MRI are inconclusive, venous sampling for PTH is advised. This may indicate the laterality of the hyperfunctioning gland and whether it is in the neck or mediastinum; PET/CT using ¹¹C-labelled methionine may be used when venous sampling is unhelpful.

Intraoperative adjuncts

iOPTH during first-time surgery for pHPT

(evidence at levels Ib–III, recommendation grades A/B)

- The use of iOPTH is recommended for patients undergoing ‘targeted’ parathyroidectomy on the basis of a single preoperative localisation study.
- If preoperative localisation with methoxyisobutylisonitrite (MIBI) and ultrasonography (USS) is not concordant and the surgeon wishes to perform a ‘targeted procedure’, the use of iOPTH is recommended.
- When preoperative localisation with MIBI and USS is concordant for single-gland disease, the use of iOPTH is of little added value.

The use of iOPTH in reoperative parathyroidectomy

(evidence at level III, recommendation grade B)

- The use of iOPTH is recommended in reoperative parathyroidectomy.

Site for venous sampling for iOPTH

(evidence at level IIb, recommendation grade B)

- Venous sampling for iOPTH can be performed from a central or peripheral site but should be consistent for any individual procedure.
- There is at present no evidence on which to base a specific recommendation for sample timing at ‘base line’ or ‘post excision’.

Selection of intraoperative criteria for iOPTH-defined cure

(evidence at levels IIb–IV, recommendations grades B–C)

- There is no evidence base on which to provide a clear recommendation for the selection of specific intraoperative criteria for iOPTH-defined cure. The most widely reported are those described by the Miami Group.
- At the present time, there is insufficient evidence to dispute the validity of iOPTH use on the basis of ‘unsuspected’ multi-glandular disease left in situ after minimally invasive parathyroidectomy.

Use of frozen section during surgery for pHPT

(evidence at levels III–IV, recommendation grades B–C)

- Frozen section is recommended when the surgeon is in doubt about whether a nodule is parathyroid tissue.
- iOPTH of tissue aspirate can also be used for nodules that are of questionable parathyroid origin.
- There is no evidence to support the use of routine frozen section

Use of MB during surgery for pHPT

(evidence at level IV, recommendation grade C)

- The routine use of methylene blue (MB) outside prospective trials to facilitate parathyroid identification during surgery is not supported because of the risk of neurological side effects in patients on selective serotonin reuptake inhibitor therapy.
- There are no data to support the proposition that MB use is associated with a lower risk of persistent or recurrent HPT.

Use of IONM during pHPT surgery

(evidence at level IV, recommendation grade C)

- There is no evidence on which to base a recommendation for the routine use of intraoperative nerve monitoring (IONM) in first-time neck exploration; its use in reoperative surgery may be of value.

Radio-guided parathyroidectomy

(evidence at Level IV, Recommendation grade C)

- Radio-guided parathyroidectomy (RGP) is an alternative technique to other intra operative adjuncts that facilitate localisation and identification of abnormal parathyroid tissue.
- There is no high-level evidence to support its use in terms of clinical efficacy or cost in preference to other techniques, particularly in patients undergoing minimally invasive surgery.
- RGP may be useful in cases of difficult reoperations.

Surgery

Initial surgical approach to pHPT

(evidence at levels IIa and III, recommendation grade B)

The initial surgical approach will depend upon preoperative localisation study findings, the presence or absence of thyroid enlargement, family history, and the preference of the surgeon.

- Bilateral neck exploration has excellent results and is always an option for the surgical treatment of pHPT.
- Selective parathyroidectomy is an option for patients with positive preoperative localisation tests undergoing first-time surgery who have no family history of pHPT, no goiter for which surgical therapy is proposed, and are not on lithium therapy.

MIP as the initial surgical approach for pHPT

(evidence at level Ib, recommendation grade A)

- MIP is considered as a safe and cost-effective procedure to treat selected patients with sporadic HPT.
- Single-gland excision through a limited neck exploration does not lead to an increased incidence of persistent/recurrent HPT compared to bilateral neck exploration.
- The prevalence and severity of postoperative hypocalcaemia is lowered by MIP.

Approach to MIP during surgery for pHPT

(evidence at levels IIa and III, recommendation grade B)

- MIP is a minimally invasive procedure that can be performed via open mini-incision parathyroidectomy, video-assisted parathyroidectomy, and endoscopic parathyroidectomy.
- None of these approaches appear clearly superior to others in terms of recurrent disease or postoperative complications.

Anaesthesia during MIP

(evidence at levels 1b and II, recommendation grade B)

- MIP can be performed under local/regional anaesthesia on an ambulatory basis.

Surgery for persistent or recurrent pHPT (evidence at level IV, recommendation grade C)

No randomised studies have been done to approach patients with recurrent sporadic HPT. Current recommendation based on case series and expert opinion can be summarised as follows:

- Concordant functional and anatomic imaging studies should be sought.
- Whenever possible, a selective image-guided approach is preferred.
- Judicious use of parathyroid autotransplantation is recommended.
- Intraoperative PTH assay is recommended to confirm biochemical cure.

Appendix

Types of evidence and grading of recommendations

The definition of types of evidence and the grading of recommendations used in the guidelines follow that of the Agency for Healthcare Research and Quality (formerly Agency for Health Care Policy and Research, AHCPR), as set out below:

Level type of evidence	Type of evidence
Ia	Evidence obtained from meta-analysis of randomised controlled trials
Ib	Evidence obtained from at least one randomised controlled trial
IIa	Evidence obtained from at least one well-designed controlled study without randomisation
IIb	Evidence obtained from at least one other type of well-designed quasi-experimental study
III	Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies, and case-control studies
IV	Evidence obtained from expert committee reports or opinions and/or clinical experience of respected authorities

Based on AHCPR [1]

Grading of recommendations	Grade evidence level description
A	Ia, Ib Requires at least one randomised controlled trial as part of the body of literature of overall good quality and consistency addressing the specific recommendation
B	IIa, IIb, III Requires availability of well-conducted clinical

studies but no randomised clinical trials on the topic of recommendation

C

IV

Requires evidence from expert committee reports or opinions and/or clinical experience of respected authorities. Indicates absence of directly applicable studies of good quality

Based on AHCPR [2].

References

1. Agency for Health Care Policy and Research (1992) Acute pain management: operative or medical procedures and trauma. Clinical practice guideline number 1. AHCPR, Rockville, p 107
2. Agency for Health Care Policy and Research (1994) Management of cancer pain: adults. Clinical practice guideline number 9. AHCPR, Rockville