

# Minimally invasive video-assisted parathyroidectomy

Interventional procedures guidance

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[www.nice.org.uk/guidance/ipg501](http://www.nice.org.uk/guidance/ipg501)

## Your responsibility

This guidance represents the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take this guidance fully into account, and specifically any special arrangements relating to the introduction of new interventional procedures. The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

All problems (adverse events) related to a medicine or medical device used for treatment or in a procedure should be reported to the Medicines and Healthcare products Regulatory Agency using the [Yellow Card Scheme](#).

Commissioners and/or providers have a responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful

discrimination, advance equality of opportunity, and foster good relations. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties. Providers should ensure that governance structures are in place to review, authorise and monitor the introduction of new devices and procedures.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

# 1 Recommendations

- 1.1 Current evidence on the efficacy and safety of minimally invasive video-assisted parathyroidectomy is adequate to support the use of this procedure provided that normal arrangements are in place for clinical governance, consent and audit.
- 1.2 Patient selection is very important and, along with treatment, should only be done in units specialising in parathyroid surgery.
- 1.3 Minimally invasive video-assisted parathyroidectomy should only be done by clinicians with specific training and a regular practice in the procedure.

# 2 Indications and current treatments

- 2.1 Hyperparathyroidism typically leads to hypercalcaemia. Symptoms include tiredness, depression, confusion, constipation, polydipsia, polyuria, the development of kidney stones, bone pain and fractures. The most common cause of primary hyperparathyroidism is a single adenoma. Other causes include hyperplasia affecting more than 1 parathyroid gland and, rarely, cancer. Secondary hyperparathyroidism can also occur, resulting from conditions such as kidney disease, vitamin D deficiency and gut malabsorption.
- 2.2 Patients with mild hyperparathyroidism may not need active treatment, but are regularly monitored. More severe hyperparathyroidism is usually treated by surgery to remove the abnormal parathyroid gland or glands.

- 2.3 Conventional open parathyroidectomy is done through a transverse neck incision, typically 3 to 6 cm long, and open minimally invasive (focused) parathyroidectomy typically needs a smaller incision of 2 to 3 cm. Endoscopic techniques have been developed that use smaller incisions, with the aims of reducing pain after surgery and improving cosmesis.

## 3 The procedure

- 3.1 Minimally invasive video-assisted parathyroidectomy is usually done with the patient under general anaesthesia. A small incision is made above the sternal notch. This allows for bilateral neck exploration. An endoscope is inserted through the incision and dissection of the parathyroid gland(s) is carried out. The operative space is maintained using external retraction: gas insufflation is not used. Care is taken to identify and preserve the recurrent laryngeal nerve. Typically, an assay is used to monitor parathyroid hormone levels during the operation.
- 3.2 An alternative technique uses a lateral approach via an incision at the anterior border of the sternocleidomastoid muscle. A space is dissected between the ipsilateral thyroid lobe, the carotid artery and the internal jugular vein to allow insertion of an endoscope.

## 4 Efficacy

This section describes efficacy outcomes from the published literature that the Committee considered as part of the evidence about this procedure. For more detailed information on the evidence, see the [interventional procedure overview](#).

- 4.1 A randomised controlled trial (RCT) of 143 patients treated by minimally invasive video-assisted parathyroidectomy (MIVAP) or open minimally invasive parathyroidectomy (OMIP) reported cure rates of 97% (66/68) and 96% (72/75) respectively ( $p=0.731$ ). An RCT of 60 patients treated by MIVAP or OMIP reported that all patients were cured at 6-month follow-up. A non-randomised comparative study of 220 patients treated by MIVAP or OMIP reported persistent or recurrent primary hyperparathyroidism in 2% (2/118) of patients in the MIVAP group and in no patients in the OMIP group ( $p$  value not reported). A non-randomised

- comparative study of 157 patients treated by MIVAP or conventional parathyroidectomy reported recurrence rates of 3% and 4% respectively at 6 months ( $p$ =not significant). A case series of 652 patients reported persistent hyperparathyroidism in 1% (6/652) of patients (follow-up period not reported).
- 4.2 The RCT of 143 patients reported that 25% (17/68) of MIVAP procedures and 17% (13/75) of OMIP procedures were converted to bilateral neck exploration ( $p$ =0.26). The non-randomised comparative study of 220 patients reported that 14% (17/125) of MIVAP procedures were converted to OMIP. The non-randomised comparative study of 157 patients reported that 5% (4/76) of MIVAP procedures were converted to conventional parathyroidectomy. A case series of 107 patients reported conversion to conventional parathyroidectomy in 8% (8/107) of patients.
- 4.3 The RCTs of 143 and 60 patients treated by MIVAP or OMIP both reported similar cosmesis scores (visual analogue scale [VAS] 0 to 100, with 100 being the best possible score) in the 2 treatment groups at 6-month follow-up (92 versus 95 [ $p$ =0.411] and 90.5 versus 87.5 [ $p$ =0.16] respectively). An RCT of 38 patients reported a significantly higher patient satisfaction score (measured on a scale from 1 [poor] to 10 [excellent]) at 6-month follow-up in the MIVAP group compared with the conventional parathyroidectomy group (7.5 versus 4.5,  $p$ <0.03). A non-randomised comparative study of 168 patients treated by MIVAP or OMIP reported a significantly higher score for patient satisfaction with the cosmetic result 1 month after surgery in the MIVAP group (85.4 versus 77.4,  $p$ =0.01), but the difference in scores was no longer statistically significant after 6 months (90.5 versus 87.5).
- 4.4 Pain scores at 1 day, 1 week and 4 weeks after surgery (100-point VAS, with higher scores representing more severe pain) were similar in patients treated by either MIVAP or OMIP in the RCT of 143 patients. Pain scores were significantly lower 24 hours after surgery in patients treated by MIVAP than in patients treated by OMIP in the RCT of 60 patients and the non-randomised comparative study of 168 patients (15.5 versus 20.4 [ $p$ <0.001] and 14.1 versus 19.8 [ $p$ <0.001] respectively). Pain scores (10-point VAS, with higher scores representing more severe pain) were significantly lower in patients treated by MIVAP than in patients treated

by conventional parathyroidectomy in the RCT of 38 patients (2 versus 3, 48 hours after surgery,  $p < 0.03$ ) and in the non-randomised comparative study of 157 patients (2.1 versus 3.6, 24 hours after surgery,  $p < 0.001$ ).

- 4.5 The specialist advisers listed key efficacy outcomes as rate of normocalcaemia after surgery, cosmesis and patient satisfaction.

## 5 Safety

This section describes safety outcomes from the published literature that the Committee considered as part of the evidence about this procedure. For more detailed information on the evidence, see the [interventional procedure overview](#).

- 5.1 Unilateral vocal cord paresis was reported in 3% (2/68) of patients treated by minimally invasive video-assisted parathyroidectomy (MIVAP) and 1% (1/75) of patients treated by open minimally invasive parathyroidectomy (OMIP) in a randomised controlled trial (RCT) of 143 patients ( $p$  value not reported). This resolved within 3 months in the 2 patients treated by MIVAP but was still present 6 months after surgery in the patient treated by OMIP. Laryngeal nerve palsy 6 months after surgery was reported in 1 patient treated by MIVAP and no patients treated by conventional parathyroidectomy in an RCT of 38 patients. Transient recurrent laryngeal nerve palsy was reported in 1% (1/100) and 3% (2/68) of patients treated by MIVAP or OMIP respectively in a non-randomised comparative study of 168 patients ( $p$ =not significant). Permanent recurrent laryngeal nerve palsy was reported in 1% (1/107, and 4/652) of patients in 2 case series of 107 and 652 patients respectively.
- 5.2 Postoperative bleeding that needed reoperation was reported in 1 patient in the case series of 652 patients (caused by a displaced clip on a middle thyroid vein).
- 5.3 Symptomatic transient hypocalcaemia after the procedure was reported in 3% (1/30) and 7% (2/30) of patients treated by MIVAP and OMIP respectively in an RCT of 60 patients, and in 5% (1/20) and 17% (3/18) of patients treated by MIVAP and conventional parathyroidectomy respectively in the RCT of 38 patients ( $p$  values not reported). Symptomatic hypocalcaemia was reported in 13% (14/107) of patients in

the case series of 107 patients (2 patients needed vitamin D supplementation).

- 5.4 The specialist advisers listed additional theoretical adverse events as infection, injury to local neuro-vascular structures or trachea/oesophagus.

## 6 Committee comments

- 6.1 The Committee was advised that minimally invasive video-assisted parathyroidectomy needs skills additional to those of open parathyroid surgery, and that adequate training is very important for parathyroid surgeons who wish to use this procedure.

## 7 Further information

- 7.1 For related NICE guidance see the [NICE website](#).

## Information for patients

NICE has produced [information on this procedure for patients and carers](#). It explains the nature of the procedure and the guidance issued by NICE, and has been written with patient consent in mind.

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## Endorsing organisation

This guidance has been endorsed by [Healthcare Improvement Scotland](#).