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EDUCATIONAL SECTION

Minimally invasive video assisted parathyroidectomy (MIVAP)

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The first endoscopic approach to parathyroid glands was reported by M. Gagner in 1996. Later, different accesses have been described using either CO_2 insufflation or external retraction. Other widespread procedures include the lateral access proposed by J.F. Henry and the central gas-less access proposed by P. Miccoli.

We hereby describe this central access which allows a bilateral exploration of the neck when necessary. Our patient data base consists of 270 patients operated on since February 1997. The mean age was 56.5 years (20–87 years). The female to male ratio was 4 : 1. The mean operative time of the procedure was 41.1 min (range 15–180 min).

In 13 cases, a video-associated thyroid resection was accomplished during the same operation for associated diseases. Conversion to traditional cervicotomy was required in 20 patients (8.09%). One laryngeal nerve palsy was confirmed 6 months after surgery. We registered one postoperative bleeding, which required us to reoperate on the patient 2 hours after first surgery. The mean operative time and complication rate clearly demonstrate that this approach, like other minimally invasive techniques, can successfully rival the results of traditional surgery for the treatment of primary hyperparathyroidism.

Key words: hyperparathyroidism; video-assisted parathyroidectomy.

INTRODUCTION

The first endoscopic approach to the parathyroid glands was reported by Michel Gagner in 1996.[1] Access has been described using CO_2 insufflation, external retraction, lateral access as proposed by J. F. Henry[2] and central gasless access as proposed by Miccoli.[3,4]

We here describe the central access approach which allows bilateral exploration of the neck.

TECHNIQUE

The patient is placed in supine position, without hyperextension of the neck, so as to increase the working space under the strap muscles. The skin is prepared to allow a possible conversion to the traditional cervicotomy. A 15 mm tranversal incision (Fig. 1) is performed 2 cm above the sternal notch, subcutaneous fat and platysma are carefully dissected. The cervical linea alba is divided longitudinally for up to 4 cm. The strap muscles on the side of the adenoma are then gently retracted with one small conventional retractor. A second retractor is placed directly on the thyroid lobe, which is retracted medially and lifted up. The dissection of the lobe from the strap muscles is performed under direct vision.

- 1.5 cm transversal skin incision 2 cm above the sternal notch.
- dissection of the strap muscles from the thyroid lobe.
- operative space maintained by means of small retractors.
- introduction of endoscopic instruments (30° 5 mm endoscope, small forceps and spatulas) and dissection of the adenoma.
- haemostasis achieved by means of vascular clips and/or electrocautery.

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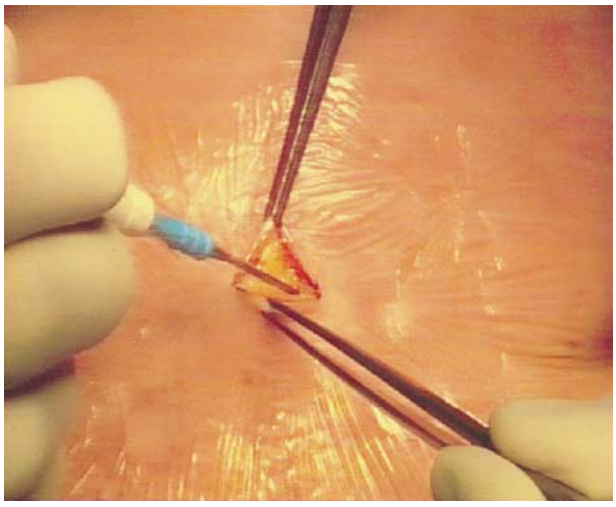

Figure 1 Skin incision.

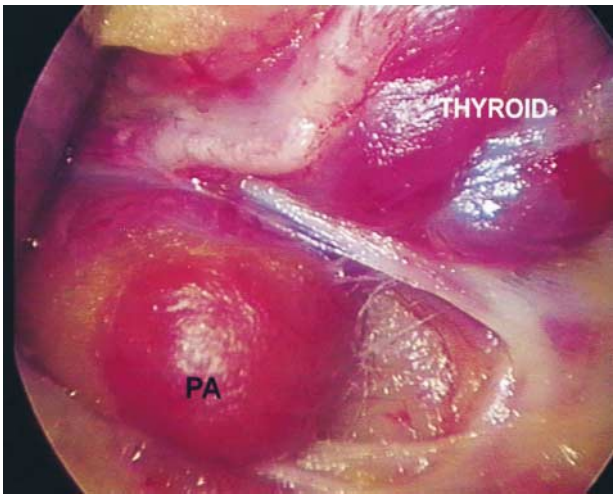

Figure 3 Parathyroid adenoma (PA).

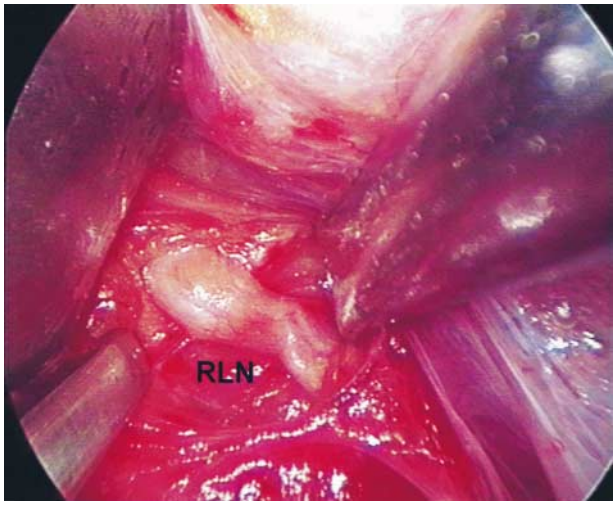

Figure 2 The recurrent laryngeal nerve (RLN).

Figure 4 Skin closure.

A 30° endoscope, 5 mm in diameter, is then introduced through the incision. Needlescopic surgical instruments including atraumatic spatulas, a spatula shaped aspirator, ear-nose-throat forceps and scissors are inserted. The procedure is then conducted endoscopically.

Three surgeons are needed to perform the video-assisted procedure. The operator holds a spatula for dissection. The first assistant holds the endoscope and a spatula-aspirator. The second assistant holds the small retractors.

The first step of endoscopic dissection comprises division of the middle thyroid vein, either between 5 mm vascular clips or with the harmonic scalpel (Ultracision®). The operative field is then completely exposed, with the carotid artery laterally, vertebral plane posteriously and thyro-tracheal groove medially. Exploration can start using small atraumatic spatulas.

The exploration starts on the side in which the adenoma is supposed to be on the basis of the preoperative imaging. Bilateral exploration can be achieved through the central incision by changing the position of the small retractors. The endoscopic magnification allows easy identification of the relevant neck structures, and particularly of the recurrent laryngeal nerve. The use of monopolar cautery or harmonic scalpel is postponed until the inferior laryngeal nerve, that generally lies near the parathyroid gland, is visualized (Fig. 2). Once the adenoma is located, gentle and accurate manipulation is mandatory (Fig. 3). When the hylus of the parathyroid gland is reached, and completely dissected, the vessels are ligated. The adenoma is removed and retrieved through the incision, which is then closed while the surgeon is waiting for the results of quick parathyroid hormone serum level measurement (qPTH).

No drainage is necessary but we advocate loose closure of the midline so as to identify early bleeding. In our series we saw one case of haemorrhage two hours after surgery, due to a displacement of the vascular clip on the

middle thyroid vein. Skin is generally closed only by means of skin sealant (Dermabond®) (Fig. 4).

RESULTS

Our experience consists of 270 patients operated on since February 1997. Mean age was 56.5 ± 13.2 years (20–87). Female to male ratio was 4 : 1. Mean operative time of the procedure was: 41.1 ± 23.1 (range 15–180) min.

- 270 patients.
- female to male ratio 4 : 1.
- mean age: 56.5 ± 13.2 years (20–87).
- mean operative time: 41.1 ± 23.1 (range 15–180) min.
- synchronous video-assisted thyroid resection in 13 cases.
- conversion to cervicotomy in 20 cases (7.4%).
- 1 laryngeal nerve palsy, 1 postoperative bleeding, 1 permanent hypocalcaemia.

In 13 cases, a video-assisted thyroid resection was accomplished during the same operation for concurrent diseases, including microfollicular nodule, and a small papillary cancer, thyroid lobectomy in 10 cases (7 homolateral and 3 contralateral) and 3 total thyroidectomies. Conversion to traditional cervicotomy was required in 20 patients. The reasons for conversion were multiglandular disease in 3 cases, a difficult dissection in 5 cases, negative exploration in 7 cases, intrathyroid lesion in 4 cases, intraoperative suspicion of parathyroid carcinoma in 1 case (confirmed by frozen section and thus treated with syncronous thyroid lobectomy), inadequacy of PTH intraoperative measurement in one case (in 5 cases the adenoma was not found even after having converted).

One laryngeal nerve palsy was confirmed at 6 months after surgery. Transient hypocalcaemia was registered in 8 cases (3.2%). Permanent hypocalcaemia occurred in one patient. We also registered two cases of persistence of hyperparathyroidism, due to intraoperative PTH quick assay failure (false positive). These patients presented in both cases a second adenoma on the opposite side to the first operation, and they were successfully treated again by the minimally invasive video-assisted approach.

In a prospective randomized study[5] comparing video-assisted parathyroidectomy with traditional cervicotomy for Primary Hyperparathyroidism (PHPT), we found that the cosmetic result as evaluated by a verbal scale, was significantly better after video-assisted parathyroidectomy. Patients who underwent MIVAP also experienced less postoperative pain ($P < 0.05$).

DISCUSSION

Mean operative time and complication rate clearly demonstrate that this approach, like other minimally invasive techniques,[2,6] can rival the results of traditional surgery for the treatment of PHPT. The advantages of a central access allow the treatment of associated thyroid and parathyroid pathologies bilaterally. The conversion rate is around 8% and it could appear high particularly if comparing it to that of video-assisted thyroidectomy;[7] the reasons for conversion though are often linked with the specific problems of PHPT, including negative explorations or intrathyroid lesions, rather than with technical pitfalls.[8]

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