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Video-assisted thyroidectomy performed in a one-day surgery setting

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ABSTRACT

Background and aim: Evidence base data have demonstrated that video-assisted thyroidectomy (VAT) has good results regarding safety, morbidity, patient cure rate, pain and cosmesis. Aim of this study was to evaluate the performance of VAT in an ambulatory setting (i.e. one-day surgery, <24-h stay).

Materials and methods: Between September 2007 and July 2008, 43 patients underwent VAT in a one-day surgery division. Patient selection criteria for VAT were: thyroid nodules <30 mm, gland volume <20 ml, no history of thyroiditis or neck surgery or irradiation, “low risk” papillary carcinoma and absence of enlarged lymph nodes. One-day surgery patient selection criteria were medical and social logistic (Materazzi G, et al. *Eur Surg Res* 2007;**39**:182–8). Intraoperative neuromonitoring (IONM) was used for RLN identification. Intact parathyroid hormone (iPTH) levels were determined early post-operatively at +6-h. Postoperative complications, conversion rate were analyzed.

Results: No cases required conversion to open surgery or ordinary recovery (i.e. >24 h). Incidence of temporary hypoparathyroidism was 11.6% (5/43) with no case of symptomatic hypocalcemia. Incidence of temporary RLN injury was 2.3% (1 patient) with no case of permanent or bilateral RLN injury. All patients were satisfied with the type of recovery.

Conclusions: This preliminary report is an example of the safe incorporation between new technologies (IONM, early iPTH measurement) with improvement of the quality and safety of VAT performed in a one-day surgery setting.

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1. Introduction

During the past years, laparoscopic and thoracoscopic surgery permitted to convert many surgical operations to minimally invasive techniques, thus obtaining less invasive and painful procedures with lower morbidity and shorter hospital stay than open surgery.^{1,2} Neck surgery was also involved in this effort. Several minimal procedures have been reported for thyroid surgery: fully endoscopic, video-assisted, and focused using mini-incision using various accesses, all aiming to improve perioperative life quality.^{3–6} In 1998, Bellantone and Miccoli^{7,8} described and developed a technique of video-assisted thyroidectomy (VAT), a completely gasless procedure. Proposed patient selection criteria for VAT are: thyroid nodules less than 30 mm on their largest diameter, thyroid gland volume less than 20 ml, as estimated by ultrasound, no history of thyroiditis or previous neck surgery or irradiation, presence of a benign nodule or of a “low risk” papillary carcinoma and absence of enlarged lymph nodes suspicious for metastasis.⁹ Up to now VAT is the mini-invasive thyroid procedure more widely used in

operating rooms.^{10,11} Recent evidence base data have demonstrated that VAT, in these selected patients, has clearly good results regarding safety, morbidity, patient cure rate and comfort, with few postoperative pain and excellent cosmetic results.^{12–18}

The aim of this study was to evaluate the performance of VAT in an ambulatory setting (i.e. one-day surgery, <24-h stay).

2. Materials

2.1. Technique

Standard video-assisted gasless approach to the thyroid gland is performed.⁹ Electrothermal bipolar vessel sealing system (EBVSS) (LigaSure™, 1520, Covidien, Boulder, CO, USA) is used for hemostasis and dissection. Superior thyroid vessels are individually divided close to the thyroid gland to avoid injuring the external branch of the superior laryngeal nerve. The inferior thyroid artery is divided close to the thyroid gland to avoid injuring the recurrent laryngeal nerve (RLN). We use a double coagulating technique for vessels: coagulation without cutting the vessel, and new coagulation-cutting distally. The Nerve Integrity Monitor (NIM-Response 2.0 System, Medtronic Xomed, Jacksonville, Florida) was used for

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RLN monitoring intraoperatively. Standard technique is to stimulate both the vagus nerve and the RLN before, during and after thyroid resection.^{19–21} No drainage is necessary. All procedures were performed by one endocrine surgeon (GD). No patients received antibiotics prophylaxis. The authors declare that they have any competing interest.

2.2. Patients

VAT has been practiced in our Endocrine Surgery Research Center since October 2005. Selection criteria for VAT patients are reported in the introduction section. Selection criteria for one-day surgery have been reported.²² Between September 2007 and July 2008, 43 patients underwent VAT for different thyroid disease (Table 1). Patients were followed pre- and postoperatively in collaboration with the Division of Endocrinology of the University of Insubria, Varese, Italy. Pre- and postoperative follow-up included direct laryngoscopy to check vocal cord mobility performed by an independent laryngologist. Serum calcium was also measured in patients who had undergone total thyroidectomy. Significant hypocalcaemia was defined as experiencing signs or symptoms of hypocalcaemia and/or having a serum calcium level that was ≤ 7.5 mg/dL (low end of normal for assay used = 8.5 mg/dL). Intact parathyroid hormone (iPTH) levels were also determined postoperatively at +6-h.²³ Surgical outcomes were evaluated in terms of incidence of perioperative complications and postoperative follow-up. Finally, one week after surgery, all patients were asked to provide information regarding their experience in VAT performed in one-day surgery setting. The degree of satisfaction with the surgery was evaluated by a patient questionnaire using 5-point grading: (1) extremely satisfied; (2) satisfied; (3) average; (4) dissatisfied; and (5) extremely dissatisfied. Participants were assured anonymity and provided informed consent.

3. Results

The mean patient age was 37.2 ± 10 (range 21–54 years). The study included 30 women and 13 men. The mean nodule size in these patients was 1.8 (range 0.6–3.2) cm. The mean thyroid volume estimated by preoperative US was 16 (range 11–25) ml. There were 53% total thyroidectomies and 47% lobectomies. All endoscopic procedures were performed successfully with no conversions. The mean operative time was for lobectomy 49.5 min (range 39–120) and total thyroidectomy 97.6 (59–130) min. No mortality was observed. Overall morbidity was as high as 18% ($N = 8$) and in most cases included transient complications. None patient required reoperation. There were no other perioperative incidents: in particular no hemorrhagic complications, or cervical hematoma was observed. One patient experienced a wound seroma. One patient reported wound infection. All surgical site complications were treated in an ambulatory way without hospital recovery. No bilateral vocal cord paresis or paralysis occurred in the study period. No case of permanent RLN paralysis in the study group. There was no case of permanent hypocalcaemia. The incidences of temporary hypoparathyroidism were 11.6% (5/43) with

no case of symptomatic hypocalcemia. The vagus nerve and the RLN were intraoperatively correctly localized and monitored in all cases. The overall incidence of temporary RLN injury was 2.3% (1 patient). Loss or decrease in amplitude of EMG signals was seen in this patient with RLN injury. All patients experienced an overnight hospital stay (<24 h). All patients reported that they were satisfied with the type of recovery stay.

4. Discussion

This preliminary report is an example of the safe incorporation between new and modern technologies with improvement of the quality and safety of thyroidectomy in a one-day surgery setting.²⁴ The minimally invasive access to the thyroid gland by means of VAT improves perioperative life quality,^{12–18} IONM prevents laryngeal nerve paralysis,^{19–21} new modalities for hemostasis and dissection reduce intra- and postoperative bleeding.²⁵ Early iPTH perioperative measurement predicts postoperative symptomatic hypocalcemia, moreover guide the surgeon for parathyroid autotransplantation, select patients requiring onset of calcium substitution and safe discharge home.²³ Traditionally, open thyroidectomy requires a 6–8-cm, or bigger, transverse wound on the lower neck while VAT approach is very small in wound length.⁹ Pain following the VAT is much less when compared with the conventional thyroidectomy, because there is less dissection, traction of tissues.^{12–18} Although randomized trials are not reported in literature, VAT approach, in selected patients, clearly demonstrates excellent results regarding safety, morbidity, mortality, patient cure rate and comfort, with short hospital stay, few postoperative pain and excellent cosmetic results.^{12–18} In this study we adopt Miccoli⁹ and Bellantone⁷ patient selection criteria for VAT and Materazzi²² one-day thyroid surgery patient selection criteria with no increase of postoperative complication and no conversion to ordinary recovery.

New technologies must be used in combination, but also must be used in conjunction with a meticulous surgical technique. Specific experience, training and standardization of the technique are essential for optimal use of modern devices. New technologies may be easily organized in centers of endocrine surgery. However, most patients with thyroid problems are still treated in smaller surgical units. Therefore, modern devices may be a logistical problem. Moreover, good results are achieved by perfect and planned interdisciplinary collaboration. An efficient structural organization is necessary to control postoperative complications.

Conflict of interest

None declared.

Funding

None declared.

Ethical approval

None declared.

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Table 1

Preoperative diagnosis ($N = 43$).

	N	%
Follicular nodule	27	63
Goiter	13	30
Hurtle	3	7

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