

Small Incision Thyroid Surgery -Vascular Compartment Surgery

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Abstract

Background

Thyroid surgery has evolved in the realm of whole surgical procedure as a unique issue because of its position in anatomically challenging area with important functions to be preserved and to maintain metabolic equity. From the days of Kocher the surgical procedure has come a long way. Morbidity and Aesthetics are modern day issues .

Methods

This study was carried out in the Department of Otorhinolaryngology and Head & Neck Surgery, Gauhati Medical College, Guwahati during period of two years from 2014 to 2016. Inclusion criteria- Benign and malignant thyroid swelling upto 6 cms in size irrespective of sex. Exclusion criteria- Malignant thyroid swelling with extracapsular involvement. All the patients underwent mini-incision thyroid surgery.

Conclusion

In this paper we have tried to evaluate the usefulness of an incision of 5cm to operate thyroid neoplasm in select patients of tumour size 6 cm or less in one of the diameter. We have described a single compartment surgery that is the vascular compartment and define a new landmark triangle for external branch of sup. Laryngeal nerve and superior thyroid pedicle in between the omohyoid , sternothyroid muscle and upper pole of the thyroid as the lower border, that is the triangle of sternothyroid omohyoid (of JP).

Keywords: mini-incision, thyroid, vascular compartment.

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I. Introduction

Anatomical Basis and Procedural Logistics

Neck and face area is studded with vital structures and planes of fascia with vessels and tubes.

There are few expandable and compressible spaces. Namely,

- 1) Lateral neck space with great vessels and sternocleidomastoid muscle, the vascular compartment.
- 2) Suprasternal space with lower pole of thyroid and inferior thyroid veins.
- 3) Sub digastric space with superior pedicle of thyroid.

These spaces can be used for negotiation of the volume of the disease to perform a surgery through a small incision. Apart from these spaces another potential space is the air space.

The small incision can be used very effectively for the organs anchored by small attachments which is already been proved by laparoscopic cholecystectomy and appendisectomy.

Thyroid gland is anchored by the vascular pedicles and the berry's ligament. Hence careful detachment of these structures enables a surgeon to come out through a smaller incision.

➤ Use of small incision > Use of instruments only > Less tissue handling > no drain > short hospital stay > Less Morbidity > Fast healing > Good acceptance with small scar.

Technical background

To deliver an organ surgically it is the basic requirement from the organ point of view to have small attachments. The incision size is 5 cm or less. Lower neck skin crease. We could negotiate total thyroid

specimen through the small incision with functional intactness of the recurrent laryngeal nerve and parathyroid glands. The principle we followed that the space and volume has to be played well to accommodate each other in the process of negotiating the tumour. The air space is always the main accommodator for the procedure.

II. Aims and objectives

To evaluate the usefulness of small incision in thyroid surgery for less morbidity and better aesthetics and with a good result.

III. Materials and Methods

This is a prospective longitudinal study of 2 years duration. A total of 30 patients were included. Pre operatively 20 patients were diagnosed as Colloid adenoma followed by 8 patients with Multi nodular goitre and 2 patients had Papillary carcinoma .

Inclusion criteria

- 1) Benign and malignant thyroid swelling
- 2) Both the sexes
- 3) Tumour upto 6 cms

Exclusion criteria

- 1) Tumour more than 6 cm
- 2) Malignant tumour with extracapsular involvement

All patients were evaluated by documenting the history, thorough clinical examination and some specific investigations.

Surgical procedure :

5 cm incision in between two sternocleidomastoid muscles in the natural skin crease two finger above suprasternal notch. After incising the platysma we define the anterior margin of sternocleidomastoid and identify the vascular compartment and the Omohyoid muscle. We preserve the omohyoid muscle in its entirety. The point of crossover of the omohyoid with the IJV is found to be the site for origination of the middle thyroid vein. During this procedure the inferior thyroid artery can easily be identified as it crosses the common carotid artery transversely. The next step we retract the omohyoid laterally and the sternothyroid medially. This step exposes the inferior constrictor muscle wide on which it become very easy to get the superior pedicle and can see the superior laryngeal nerve without any extra surgical effort. Till this step the surgeon doesn't have to mobilize the thyroid gland at all. After getting control of the superior pole and ligation of the middle thyroid vein, the strap muscles are made free from the surface of the thyroid gland. The exposed inferior constrictor continuation easily leads the surgeon to the inferior fibres of it which is the beginning of the cricothyroid muscle. This very steps exposes the recurrent laryngeal nerve and the Berrys ligament . The paratracheal area becomes evident to identify the superior parathyroid .Then the whole gland is mobilize up in the subhyoid space to get control of the inferior thyroid veins. In doing the whole procedure the control of the all anchor of the gland can be done in a single compartment without much handling of the thyroid there by reducing the possibility of bleeding and having better control of the vital structures. In this procedure we have defined a new triangle of sternothyroid omohyoid of JP, where the superior thyroid pole forms the base to get the superior pedicle and to see superior laryngeal nerve effortlessly on process.

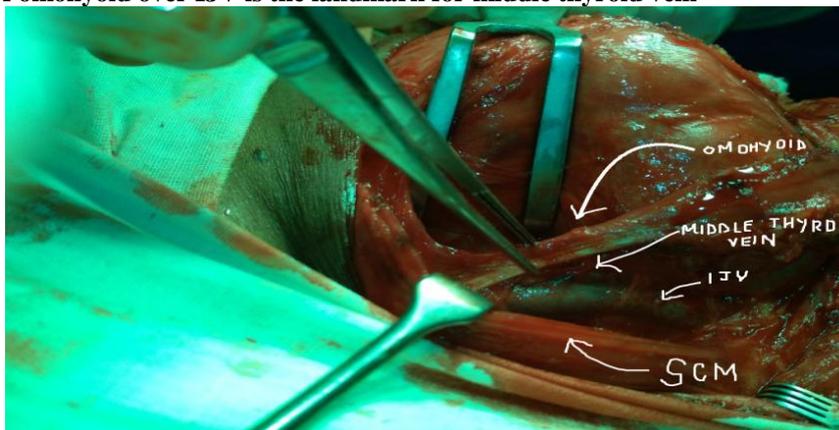
IV. Results and observation

Diagnosis	No. of patients	Sex	Surgery	Hospital stay(mean in days)	Post op hypocalcemia(no of patients)	Post op Hematoma
Colloid adenoma	20	M-8 F-12	Hemithyroidectomy	3	-	-
Multinodular goitre	8	M-3 F-5	Total thyroidectomy	4	2	1
Papillary carcinoma	2	M-1 F-1	Total thyroidectomy with central neck dissection	10	2	-

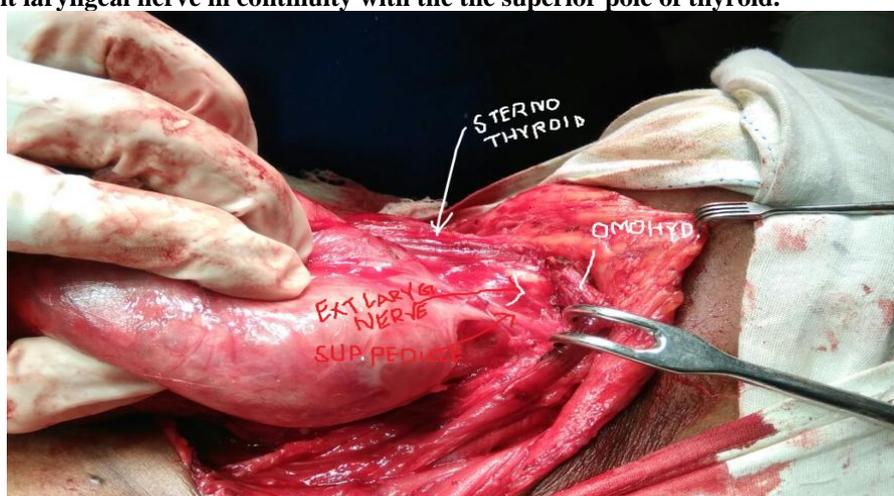
4 patients of total thyroid had temporary hypocalcemia corrected within hospital stay and were discharged with oral calcium which was stopped within 6 wks. No patient had permanent hypocalcemia. There was no recurrent or superior laryngeal nerve palsy.

V. Surgical Photographs

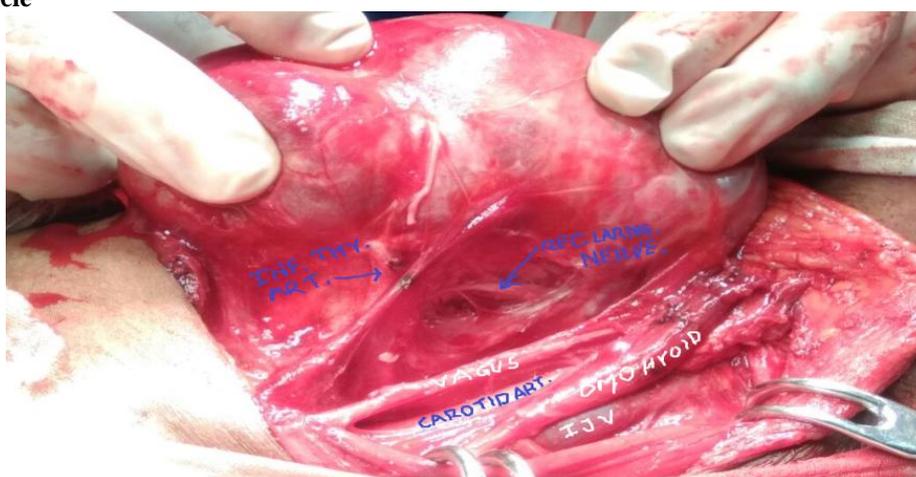
1. Crossover point of omohyoid over IJV is the landmark for middle thyroid vein



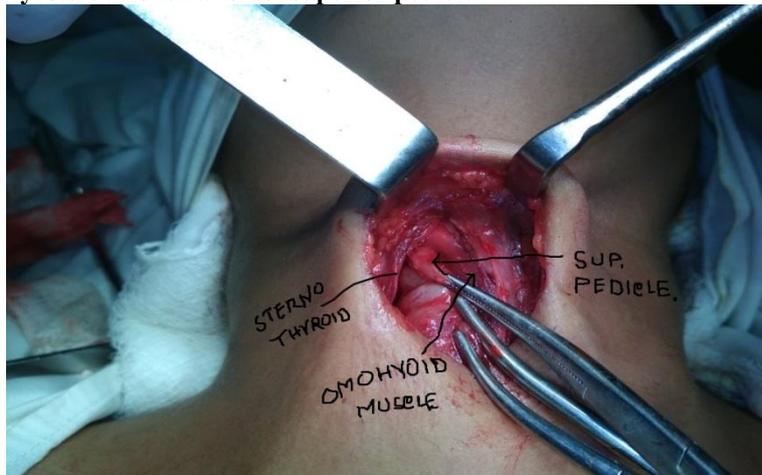
2. Vascular compartment showing Common carotid artery, internal jugular vein, inferior thyroid artery with recurrent laryngeal nerve in continuity with the the superior pole of thyroid.



3. Triangle of Sternohyoid omohyoid (of JP) showing external branch of superior laryngeal and superior thyroid pedicle



4. A small incision thyroid demonstration of superior pedicle.



5. Excised specimen of total thyroidectomy.



6. Closure of 5 cm incision margins.



VI. Discussion

It was Theodor Kocher who pioneered the conventional thyroidectomy in 1909 (1). Since then the surgeons had tried other way to minimise the morbidity and to increase the cosmesis. The terms like minimally invasive video assisted thyroid surgery (MIVAT), minimally invasive thyroid surgery (MITS) are in use for different procedure. It was Paolo Miccoli from Italy who introduced the endoscopic thyroidectomy (2, 3) first, though the scar is not in the neck the invasiveness does not seem to be minimal. This also has got a limitation to address the neck, if at all the necessity arises. The procedure is not widely practised. Ferzli et al(4) first reported minimally invasive nonendoscopic thyroidectomy (MINET). In his paper he used an incision size of 2.5 cm incision and an midline incision to separate the straps. Brunaud et al(5) termed minimal incision as 3cm or less.

Subrahmanyam et al(6) used a 2 cm incision at the upper pole of the thyroid swelling . In both the procedures the strap muscles were cut. Mehmet Zafer et al (7) used 2.5 cm anterior incision with mid line split in the strap. Terris D J et al (8) commented small incision to be less than 6 cm. In our procedure we used an incision size of 5 cm in the lower neck skin crease. We used the vascular compartment to get an excess to the entire vascular pedicle without any much surgical handling of the thyroid so to minimise the bleeding. In our procedure we have defined a new area in between the omohyoid and sternothyroid muscle to get the upper pedicle, coming down to the area of omohyoid cross over of the IJV to get the middle thyroid vein. The gland become easy to mobilize. The straps are then lifted from the surface of the thyroid avoiding any incision on strap, its fascia and ligation of anterior jugular vein. This procedure is not described in any literature previously .The concept of the surgical invasiveness can't be limited to the length of the incision and it should be extended to all the structure dissected during the procedure. Jean Francois Henry et al(9).In our procedure there is very minimal handling of the thyroid tissue , no muscle cut and the whole surgery can be contemplated in a single compartment .We have termed it as a vascular compartment surgery. In this procedure that single compartment enables the surgeon to have control over the lateral neck and central neck as well if neck dissection is necessary. Retracting the omohyoid laterally , sternothyroid medially and the gland medially gives the exposure to EBSLN , the sup pedicle, the inf . constrictor , the cricothyroid and the RLN in a single field . We did not have any remarkable complication except one patient of haematoma. The new technique are confronted with the fact that they have to compete with conventional thyroidectomy with its high standard of treatment and on terms of both efficacy and safety (10). To our knowledge the concept of vascular compartment and sternothyroid mylohyoid triangle is not available in any literature so far.

VII. Conclusion

A 5 cm incision gives the surgeon enough flexibility to complete a total thyroidectomy also with one lobe diameter of not more than 6 cm with neck dissection when vascular compartment and thyrohyoid –omohyoid triangle(of JP) is judiciously used with minimal complication and maximum benefit including cosmesis.

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