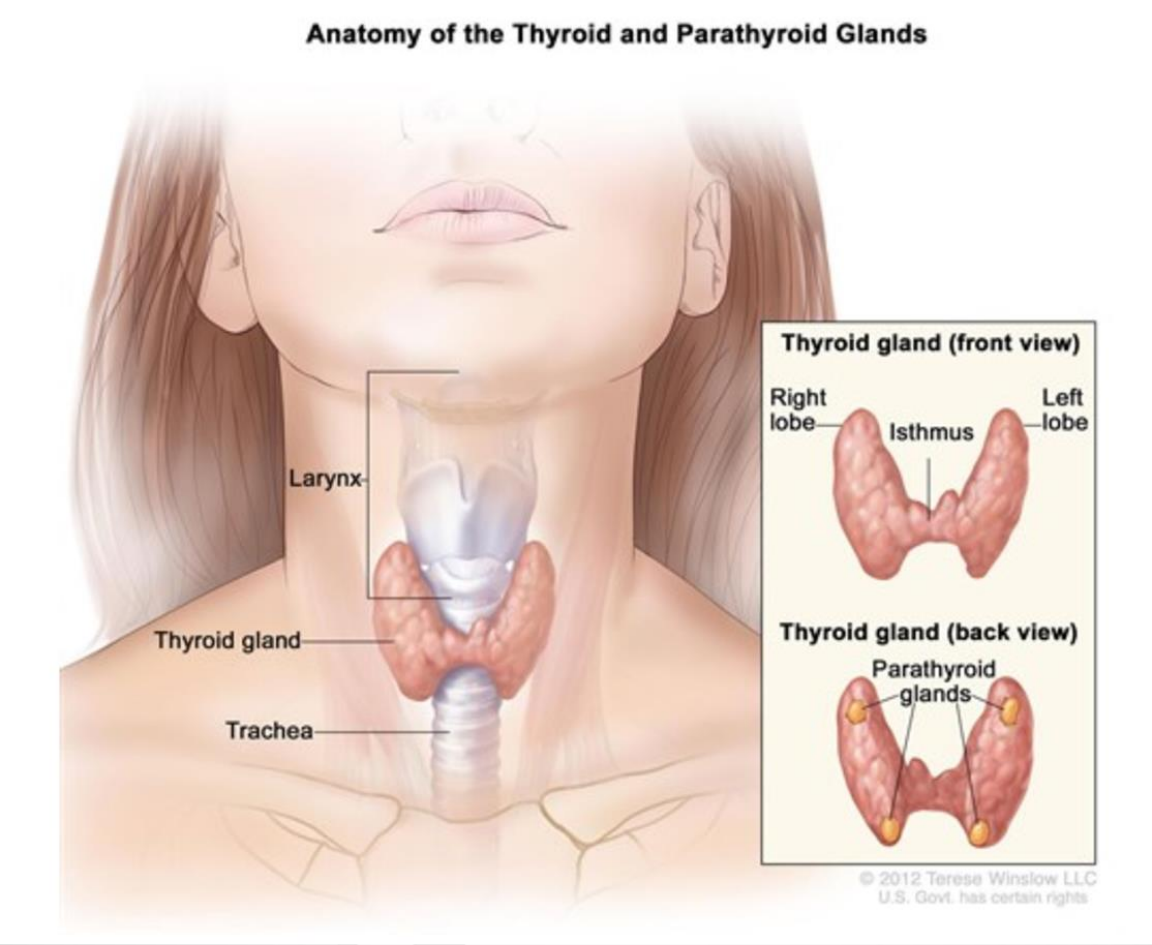
Surgical approach to pathological thyroid gland

PROF. AYMAN MISMAR

edited by : INSAF IYAD

Introduction: Anatomy of the Thyroid Gland



Goals of Surgery:

- 1-to **remove** the primary tumour and its local extension.
- 2-to minimize treatment related **morbidity**.
- 3-to permit accurate **staging**.
- 4-fascilitate postop. **Radioactive Iodine** ttt.
- 5-fascilitate long term postop. **Surveilance** ↳thyroglobulin
- 6-minimize disease **reccurence** and mets.

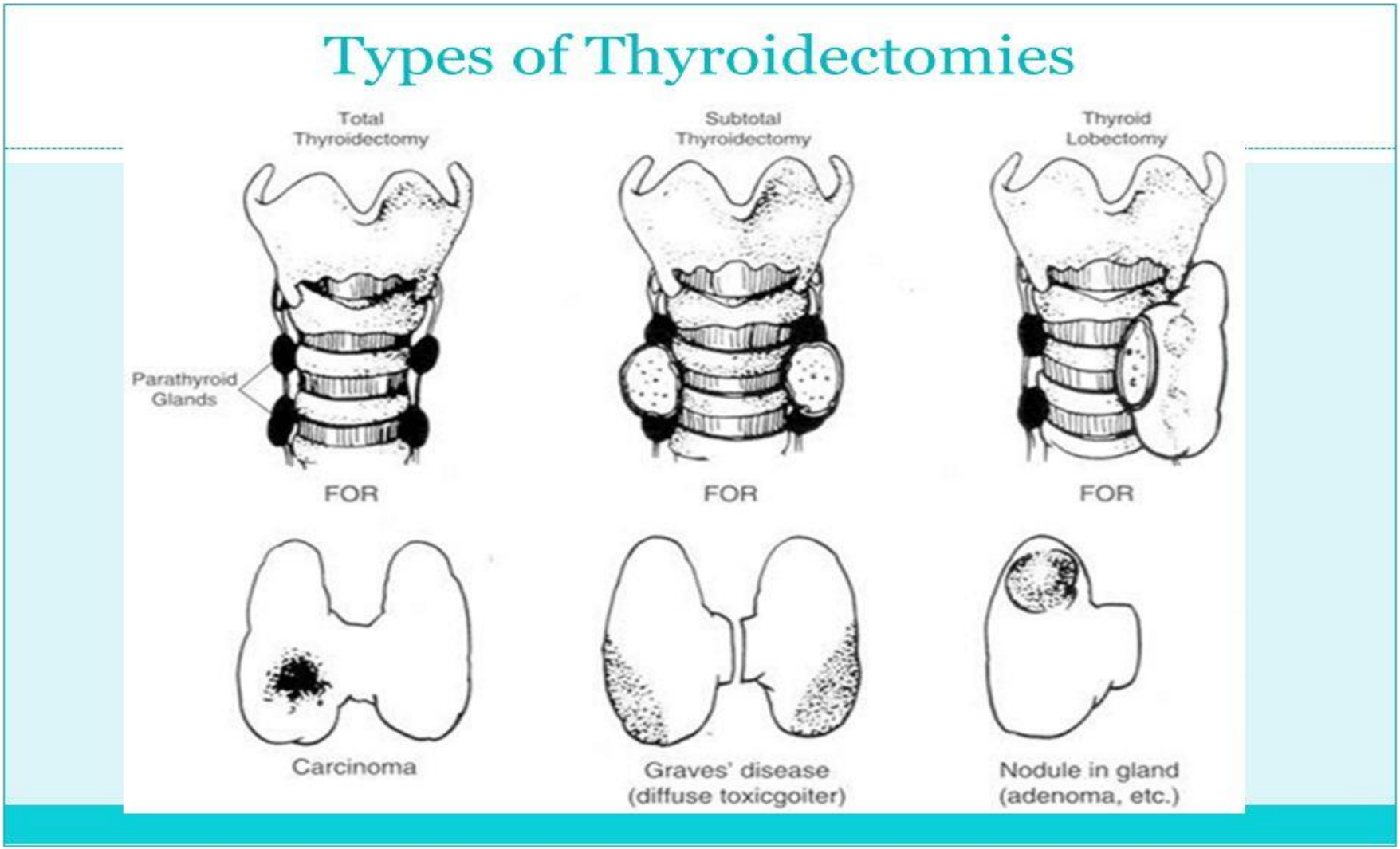
its not benificial to give iodine therapy before thyroidectomy cuz normal thyroid tissue will uptake it & tumor won't benifit from it
(normal thyroid affinity > tumor > rest of body)

- Type of Surgery Vs approach.

how much thyroid tissue removed (which parts)

Site & way of entery (endoscopic, open, transoral, min. invasive)

Thyroidectomy types



① hemithyroidectomy (lobectomy)

- we don't do mass exision only (to prevent missing surrounding tumor cells & have a good safety margin) so lobectomy is the minimum excision to achieve the goal of surgery
- we do it as extended hemithyroidectomy (also remove isthmus) because:
  - ↳ compression hyperplasia of thyroid involves isthmus & this does an annoying mass appearance for pt
  - ↳ in case recurrence or spreading happened at the isthmus or the other lobe there will be adhesions at the site of 1st surgery so we want to make them as far as possible from the other lobe

(ب يكون في كتير adhesions اذا انظرنا نفتح مرة تانية لأي سبب)

② Subtotal thyroidectomy

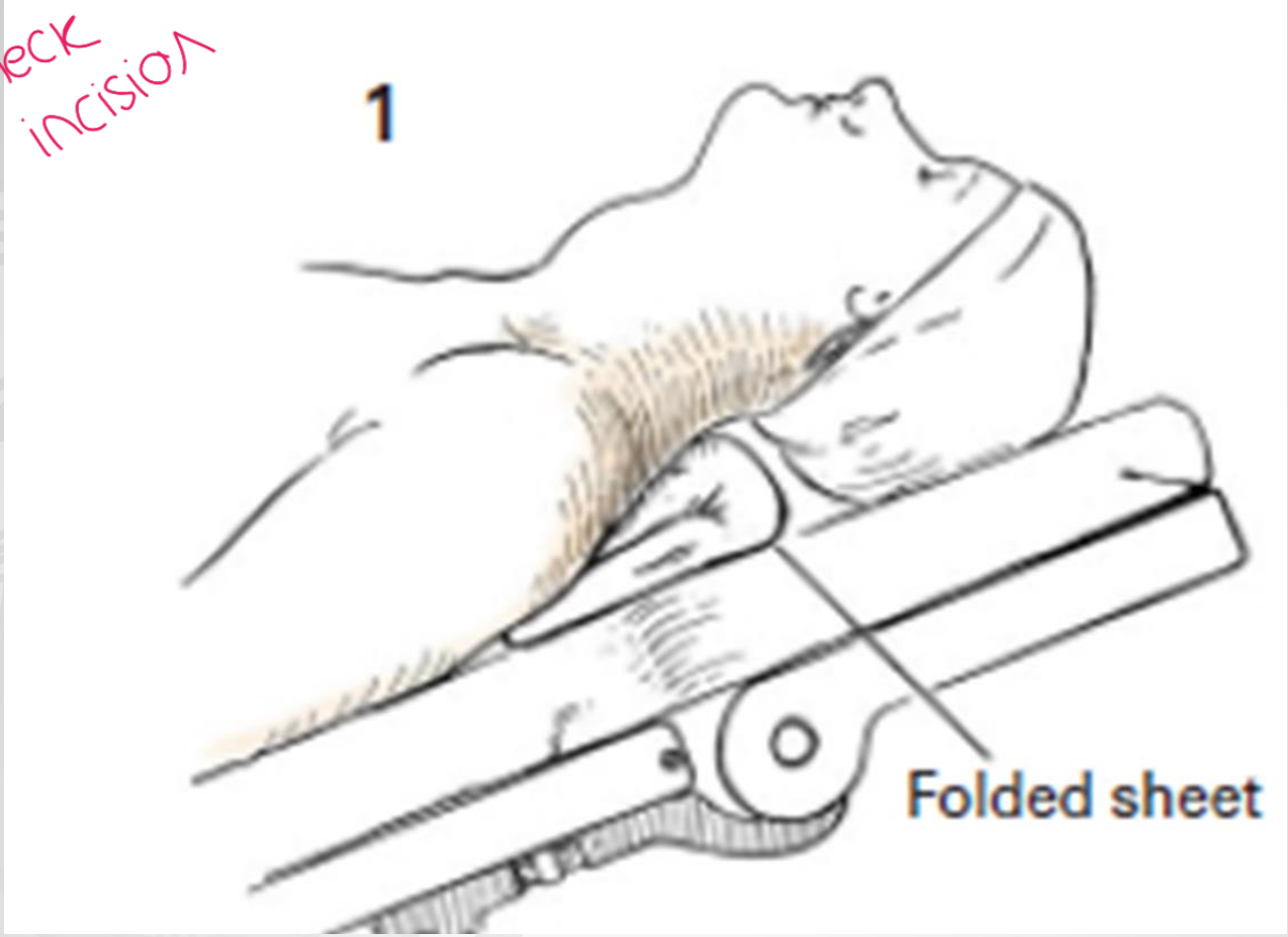
- was used for graves disease, remove thyroid leaving 5g (≈ 1/4 thyroid) which is enough to make pt euthyroid
- not used anymore because:
  - ↳ it has the same complications as total thyroidectomy (injury of recurrent laryngeal N, hypoparathyroidism
  - ↳ risk of recurrence cuz of hyperplasia
  - ↳ its only benifit over total thyroidectomy is that pt won't need thyroxine

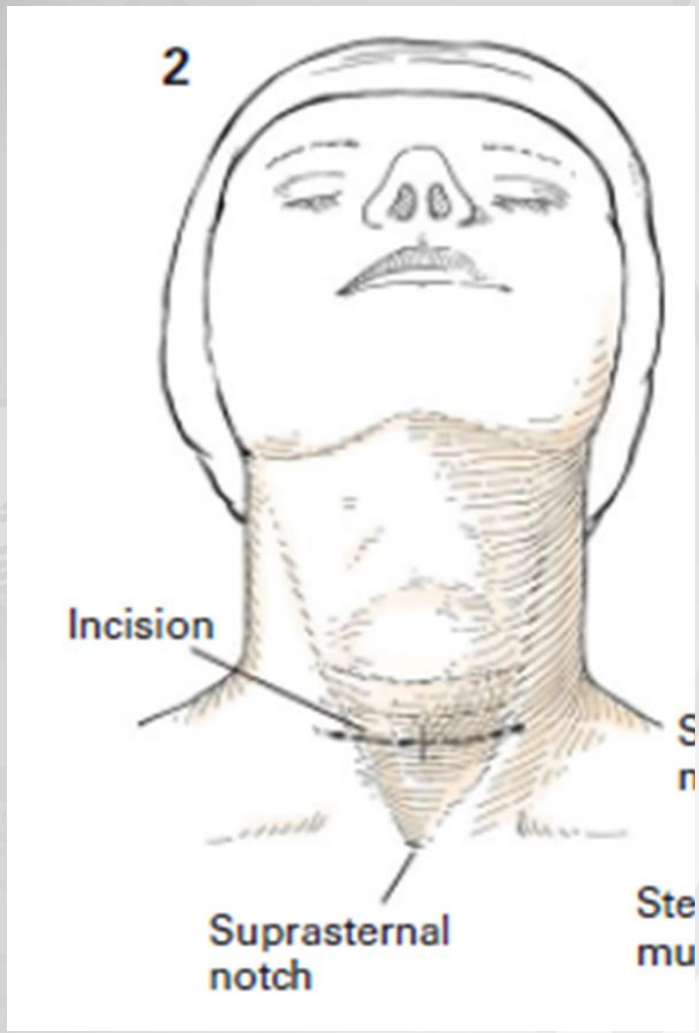
Thyroidectomy types

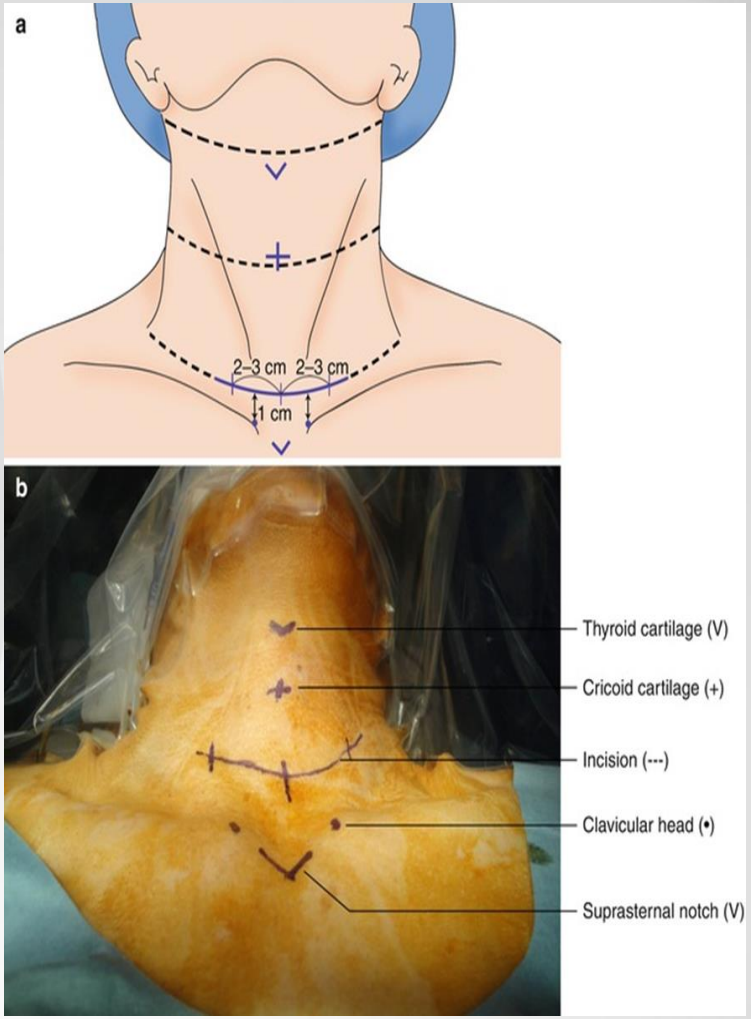
- **Near-total thyroidectomy:** Almost same as total, but a little thyroid tissue around one parathyroid gland is preserved & around recurrent laryngeal N (to protect them from injury
- **Isthmusectomy:** Dividing the isthmus
  ↳ indications: tumor in isthmus, riedel's thyroiditis

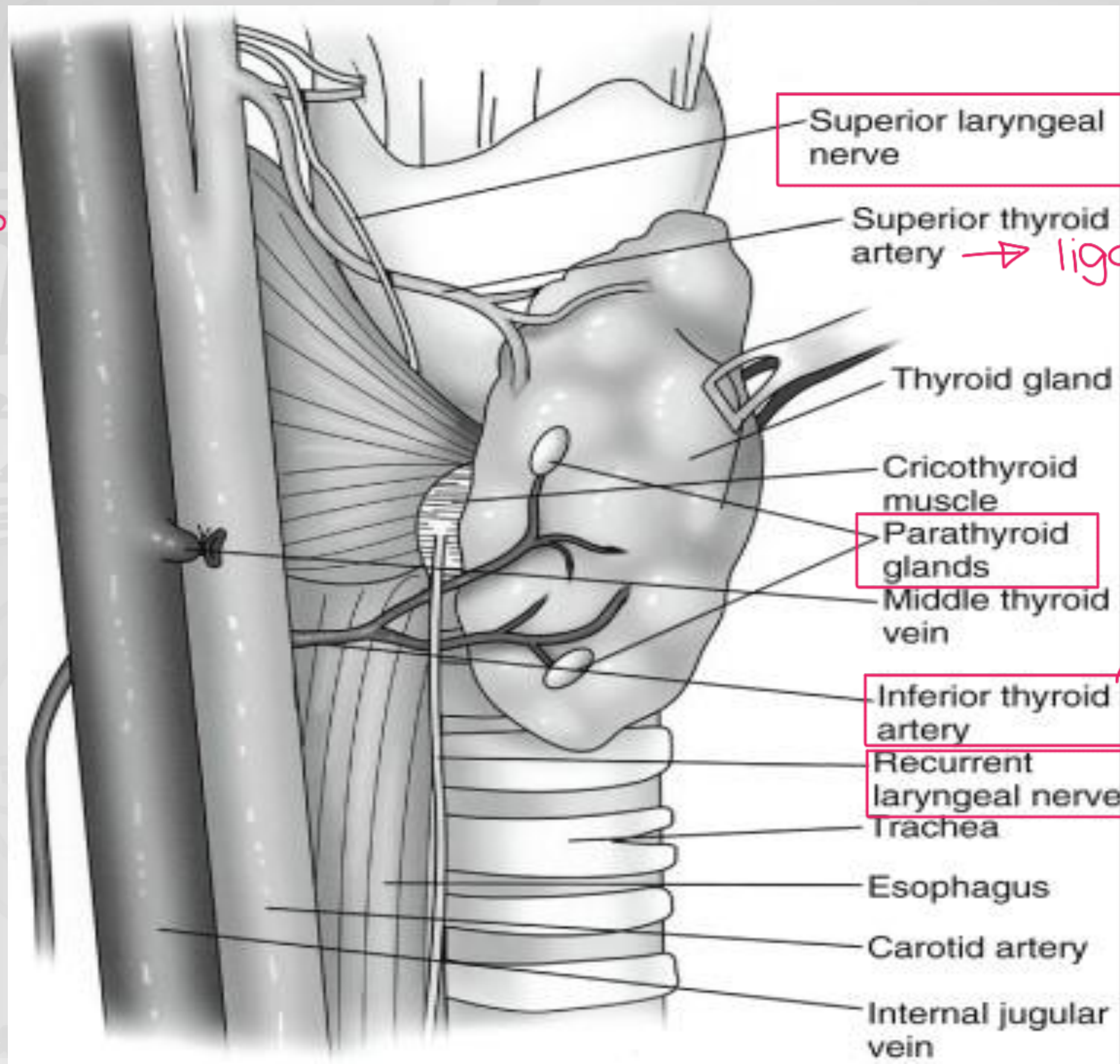
Conventional thyroidectomy

Supine
extended neck
Neck collar incision




2
Incision
Suprasternal notch


a
2–3 cm
2–3 cm
1 cm
b
Thyroid cartilage (V)
Cricoid cartilage (+)
Incision (---)
Clavicular head (•)
Suprasternal notch (V)



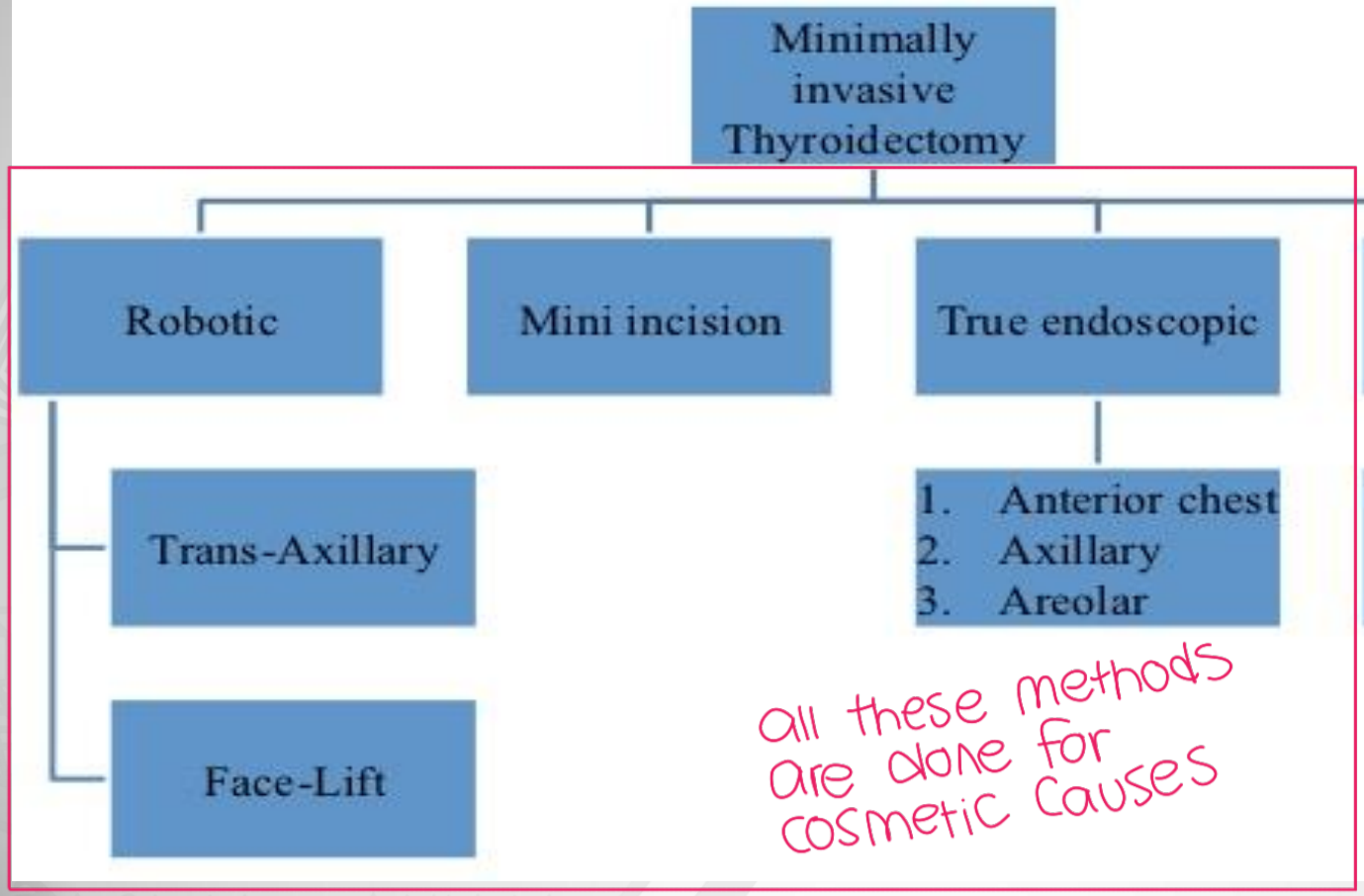
الاستاذ الي عليهم مربع لازم ننتبه عشان ما يصير لهم injury

Superior thyroid artery → ligation

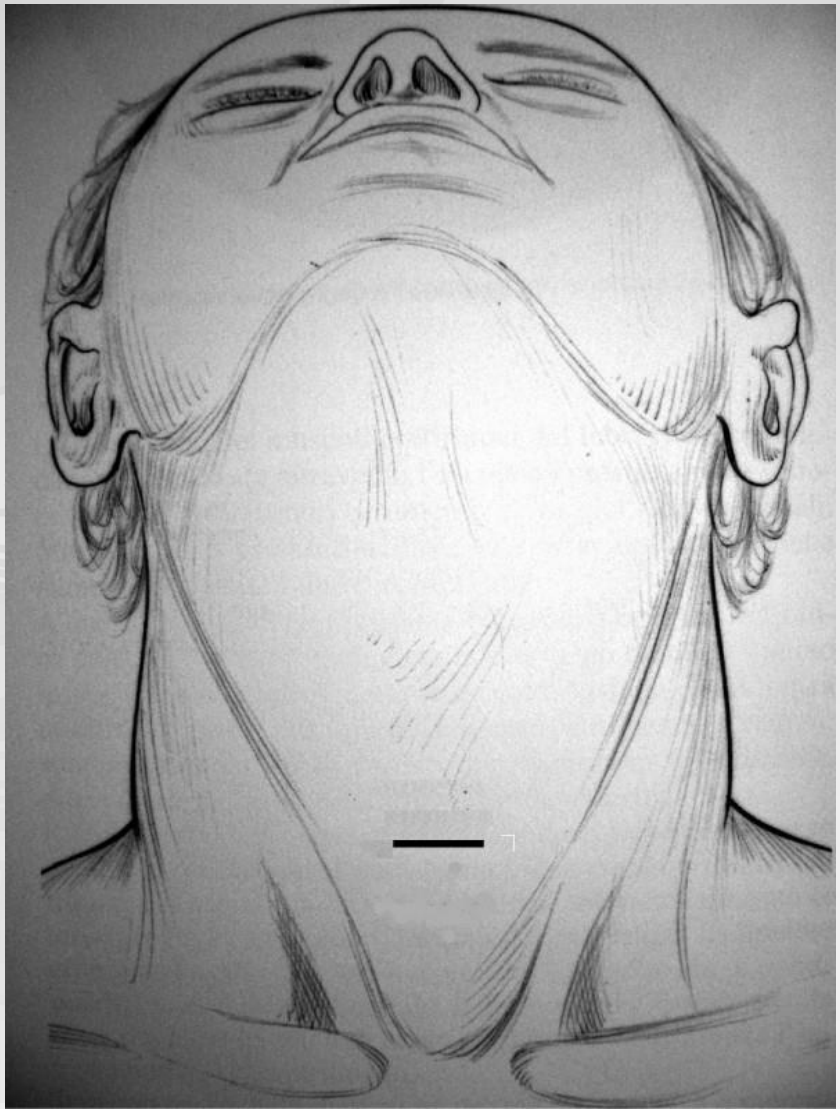
Inferior thyroid artery → cuz it supplies parathyroid

Recurrent laryngeal nerve → in tracheo esophageal groove (we identify it by N stimulator)

Minimally Invasive thyroidectomy

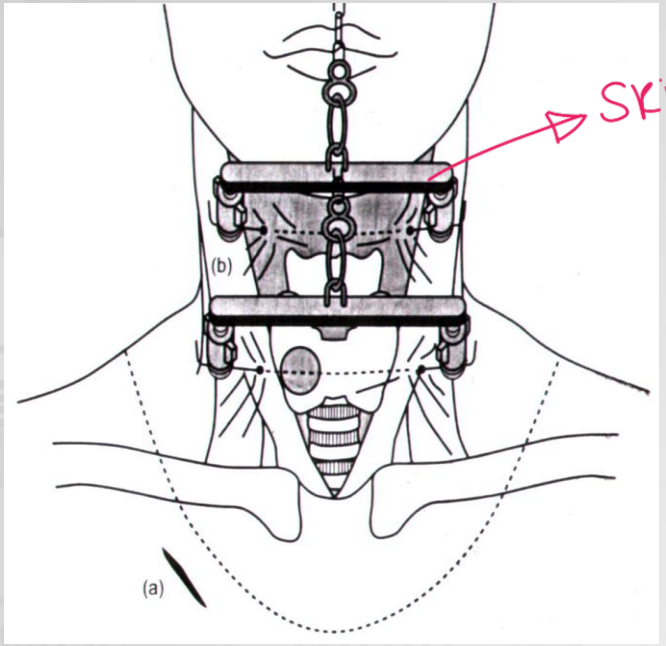


Miccoli : central neck access : J Endoc Invest 1999



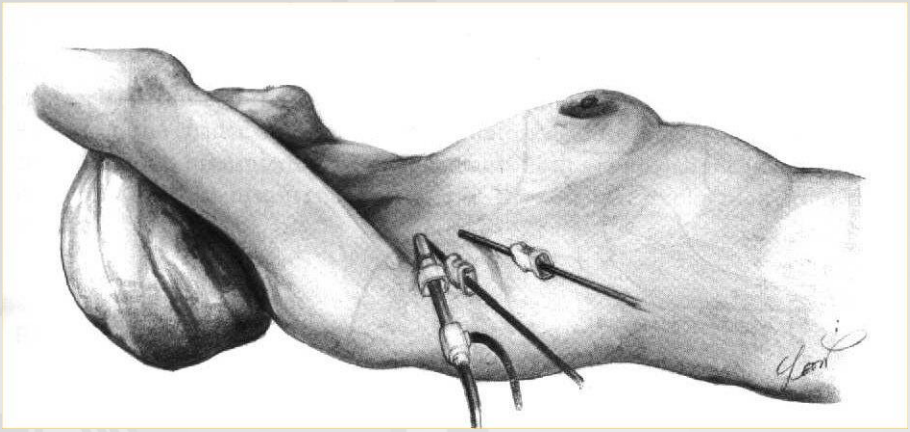
Shimizu

Neck access : J Am Coll Surg 1999



External Retraction
(Kirschner)
lateral Incision
(SCM border)
subclavicular Incision (5cm)

Ikeda *axillary access:* *J Am Coll Surg* *2000*



Incision 3 cm in axilla (ant. axillary fold

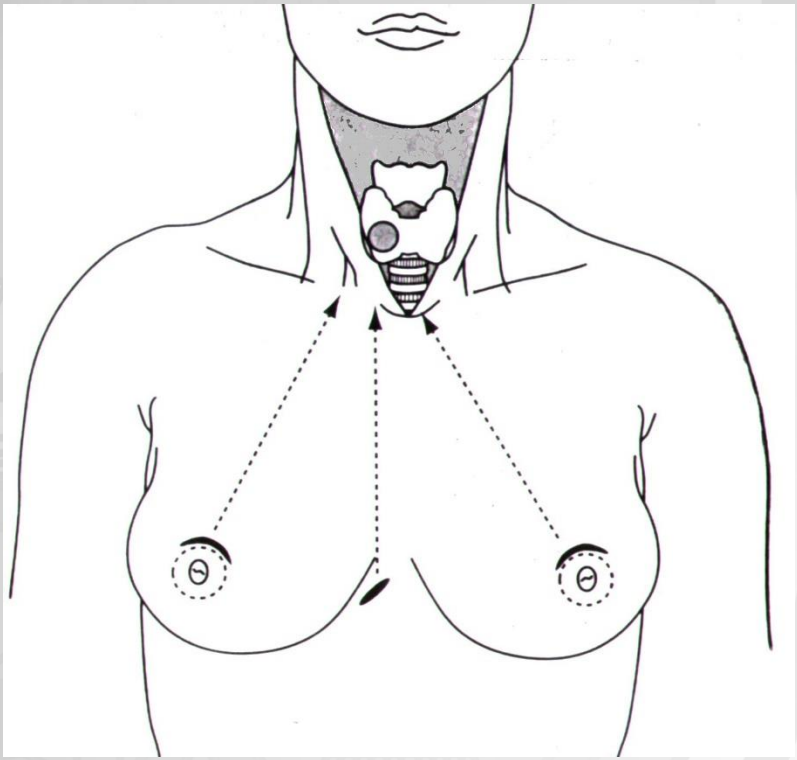
Insufflation of CO_2 (4 mm Hg) Skin retractor بجيبوا هواء بدل ال

Flexible Endoscope

1 trocar near the main incision

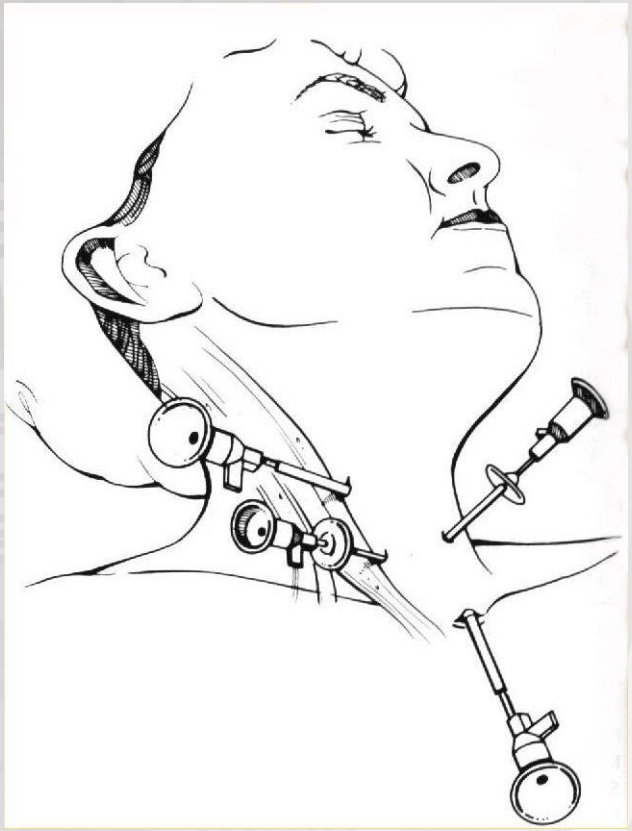
Ohgami

breast access **:** ***Surg Laprosc 2000***



Three incisions:
1 presternal
2 periareolar
Insufflation of CO_2

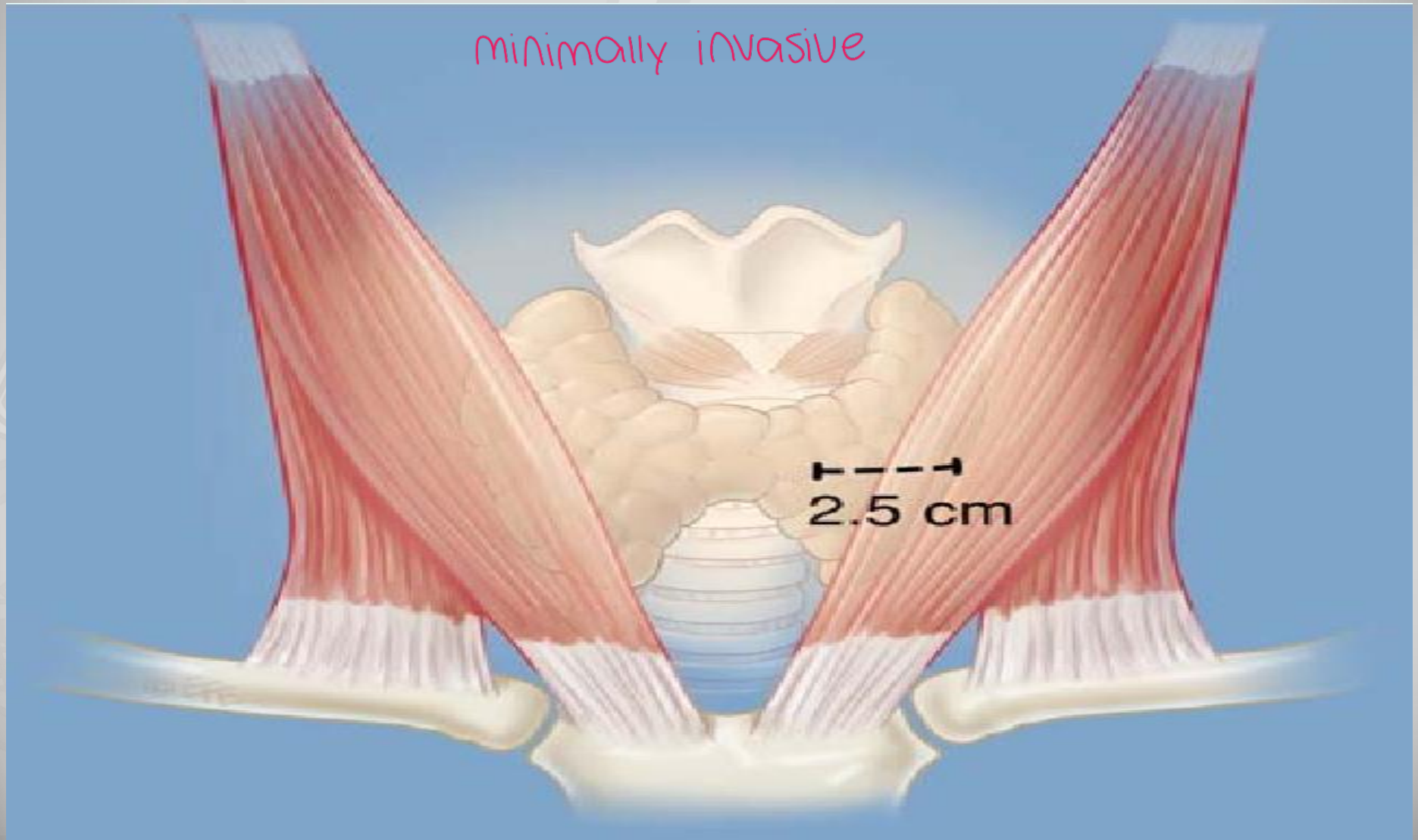
Gagner *supraclavicular access* : *Thyroid 2001*

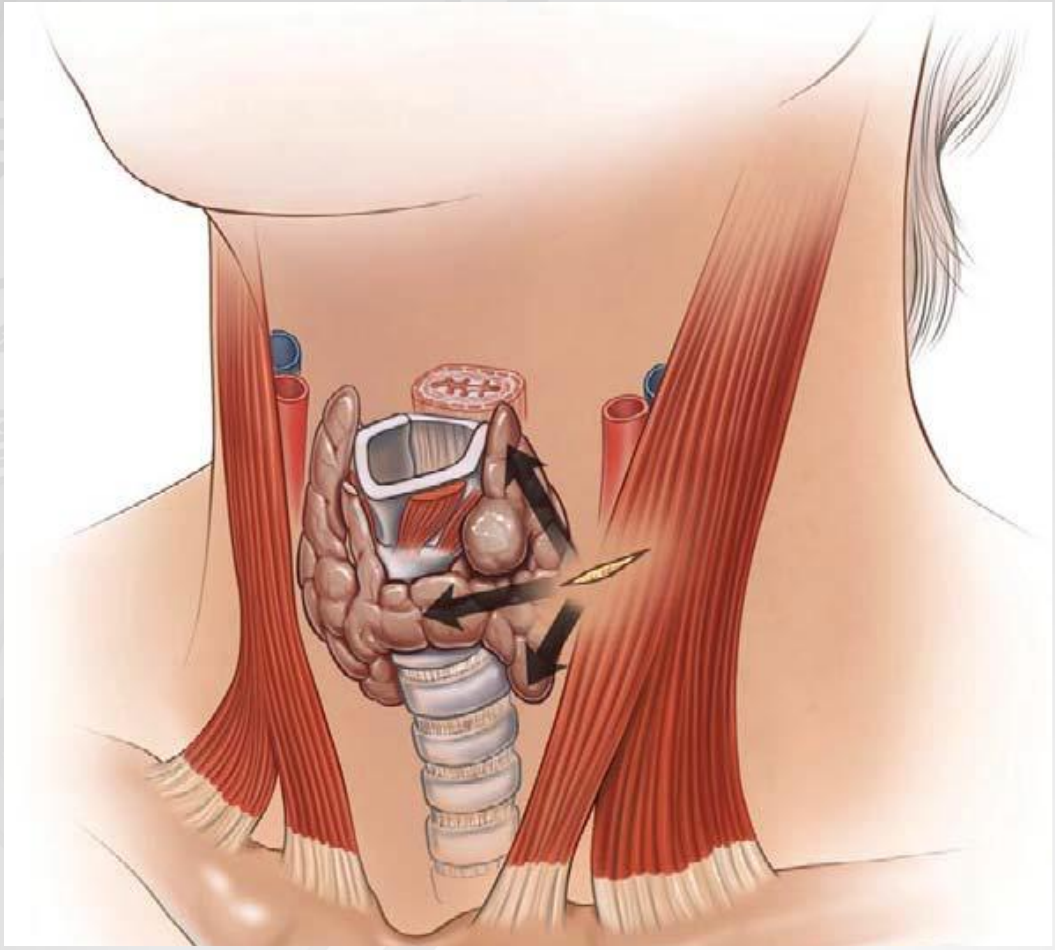


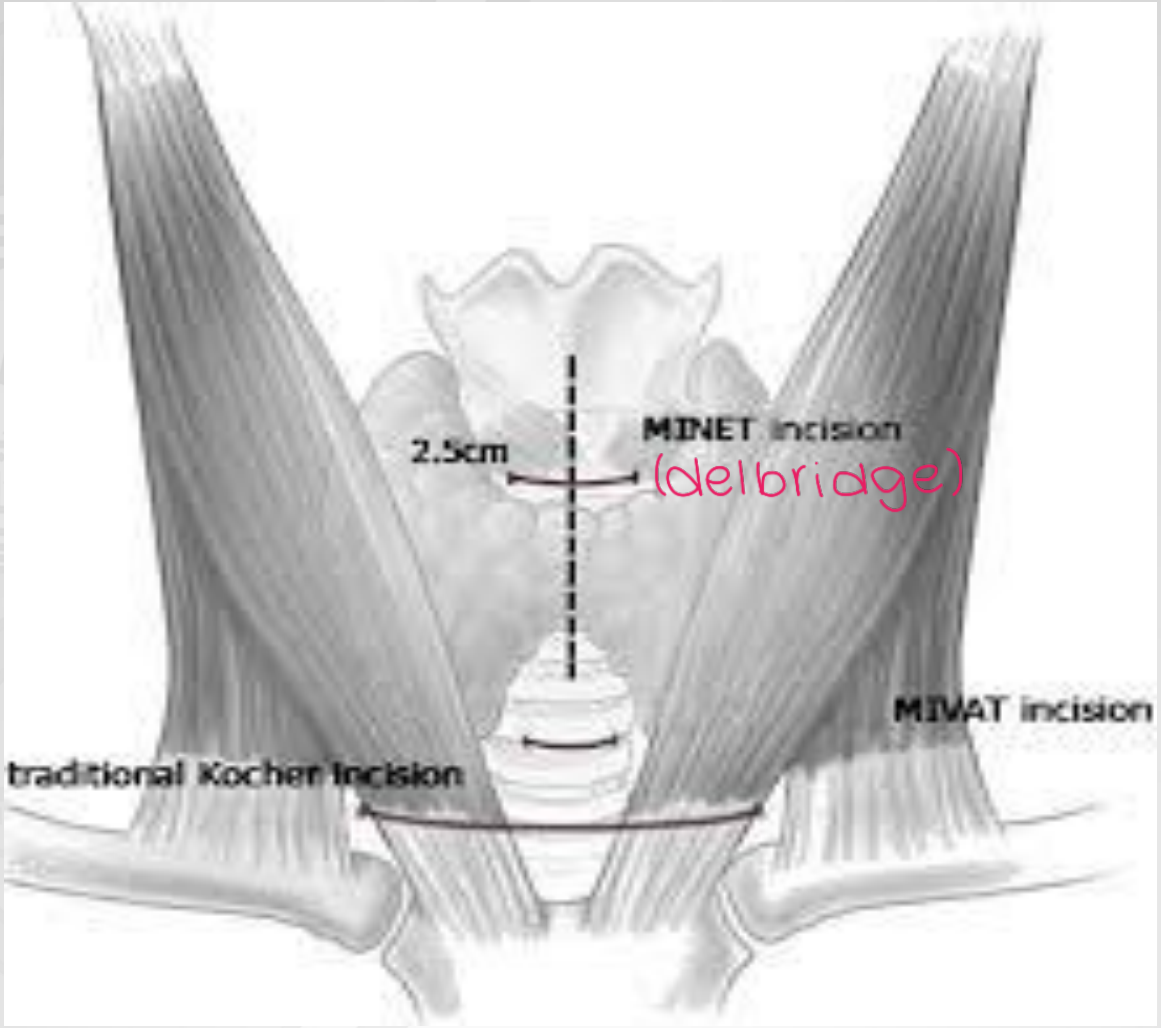
total endoscopic thyroidectomy

Insuflation of CO_2 (8 mm Hg)
Incision central (5 mm trocar)
3 Trocars accessory:
mid line
mid border SCM
sup border SCM

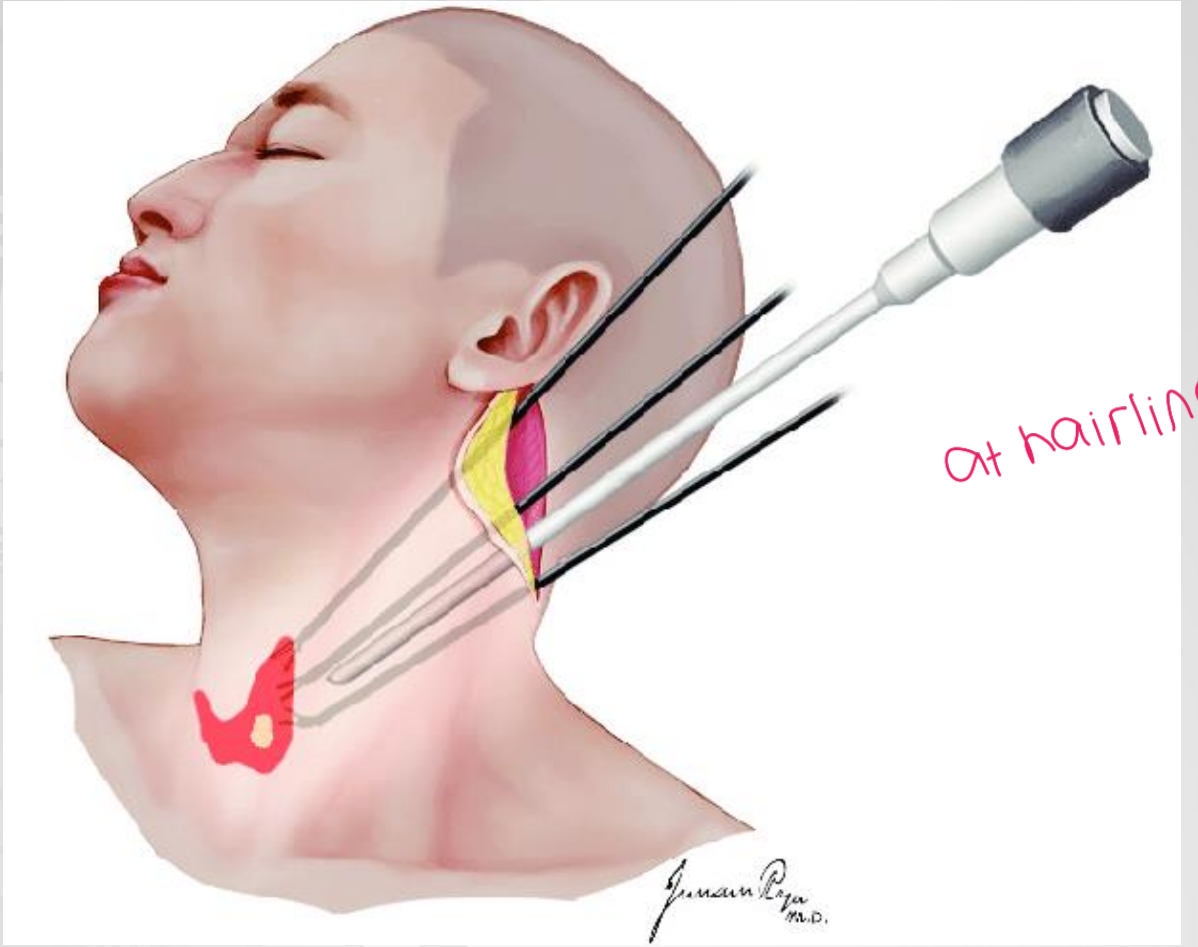
Delbridge 2006





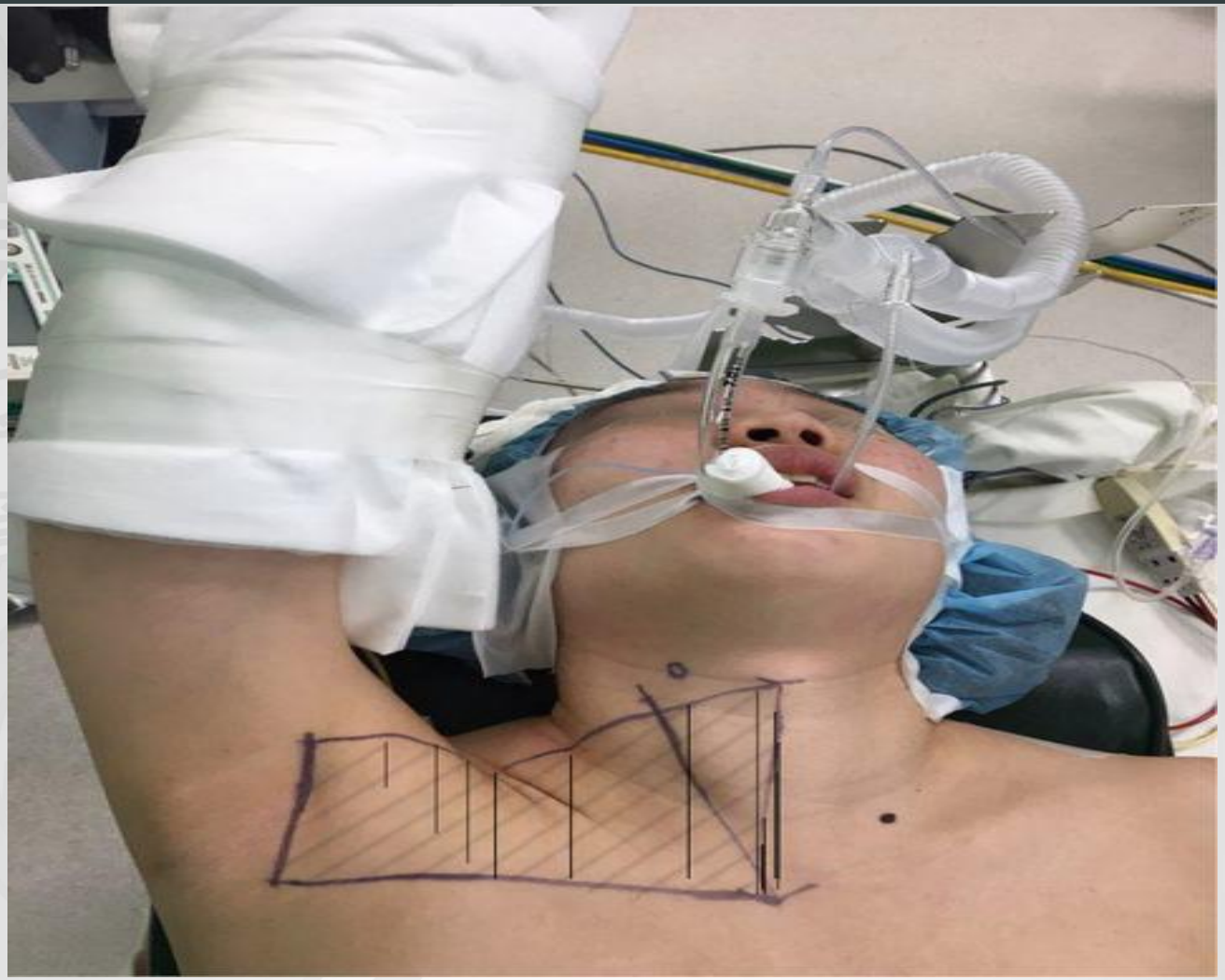

2.5cm
MINET incision
(delbridge)
MIVAT incision
traditional Kocher Incision

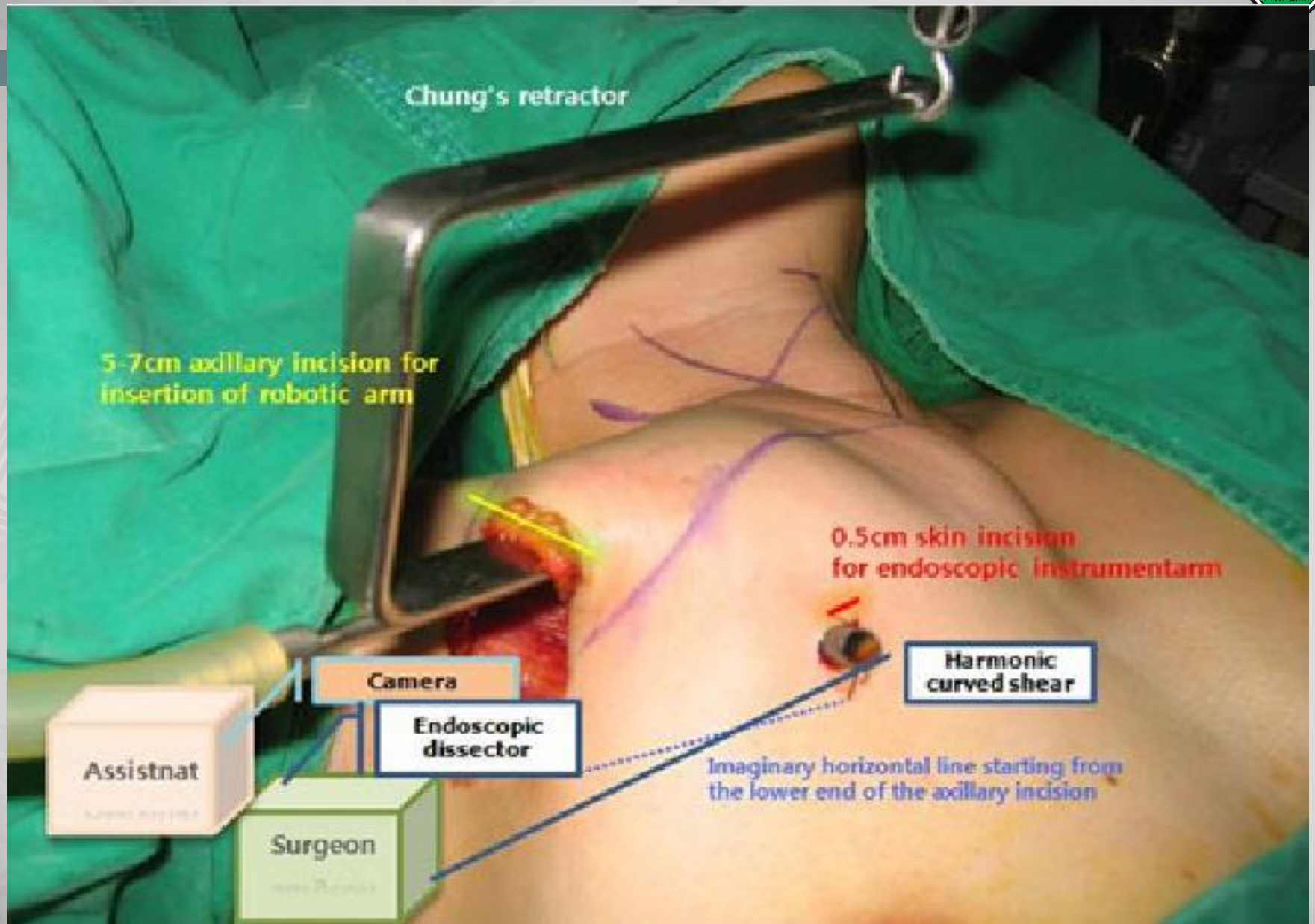
Terris Robotic Face lift (retroauricular approach) : Laryngoscope 2011




retractor

axillary approach




Chung's retractor
5-7cm axillary incision for insertion of robotic arm
0.5cm skin incision for endoscopic instrumentarm
Harmonic curved shear
Camera
Endoscopic dissector
Assistnat
Surgeon
Imaginary horizontal line starting from the lower end of the axillary incision

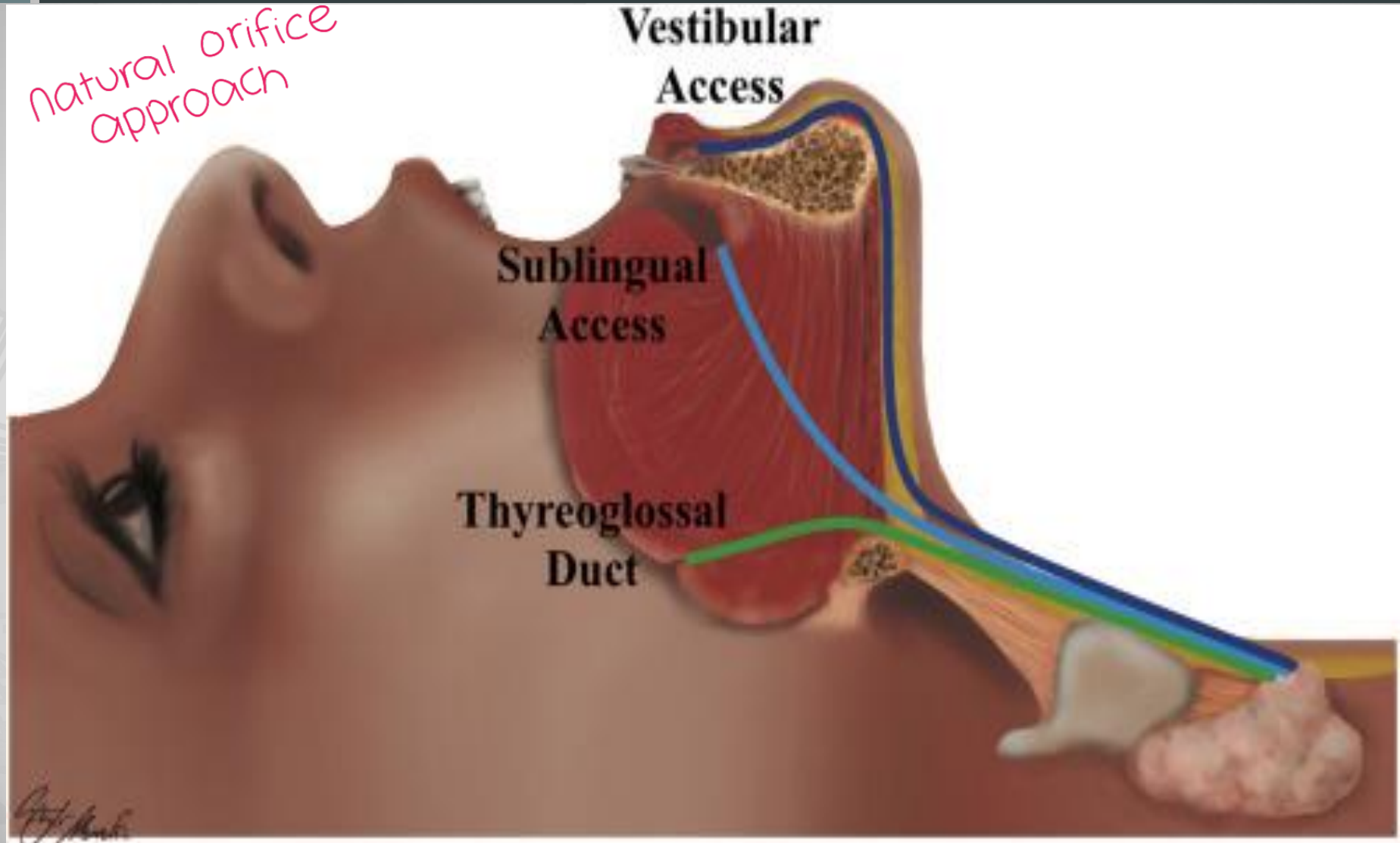
ENDOSCOPIC THYROIDECTOMY :

Different Techniques and Approaches

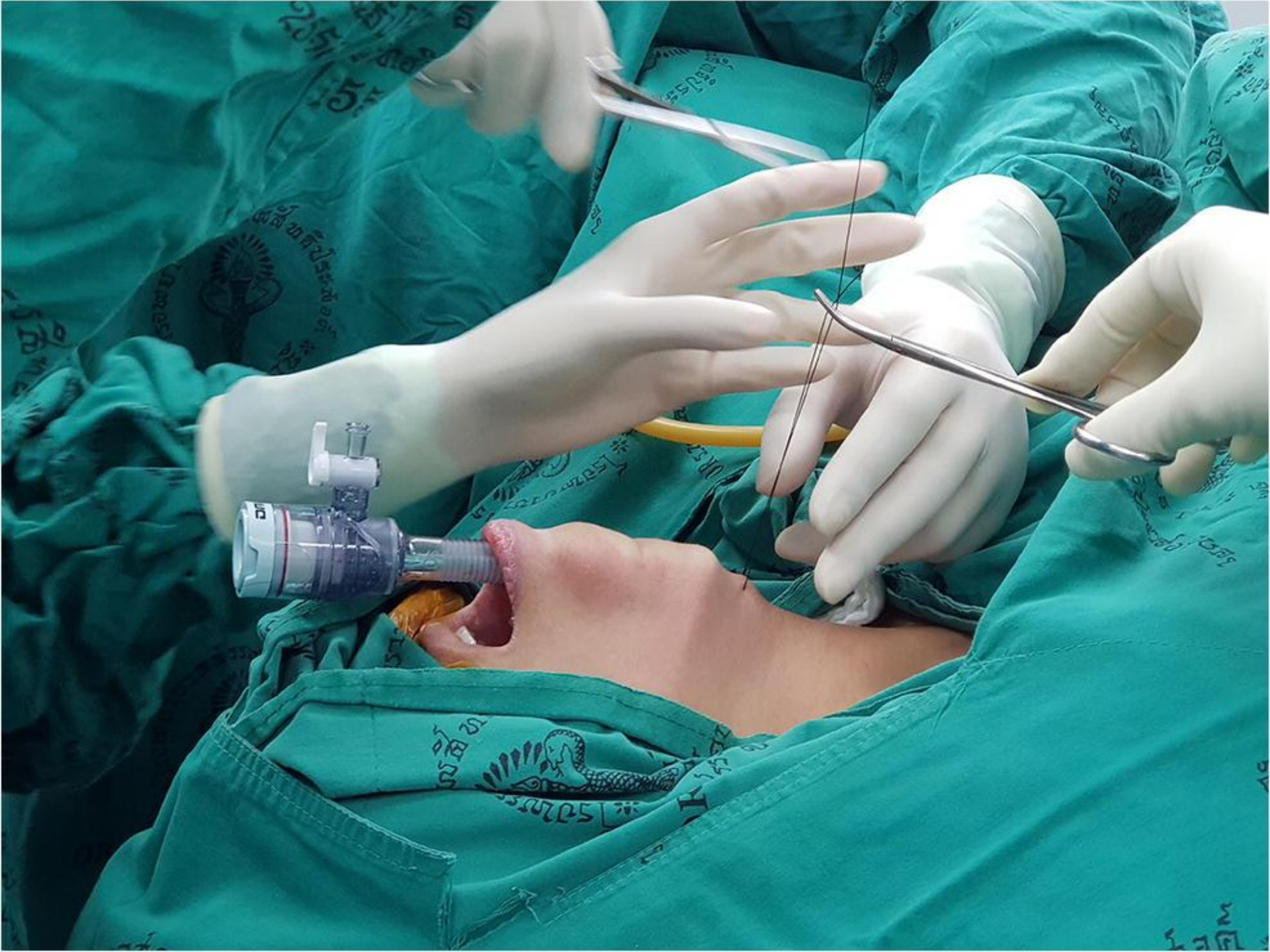
- **Axillary and breast access should not be considered minimally invasive operations to approach thyroid**

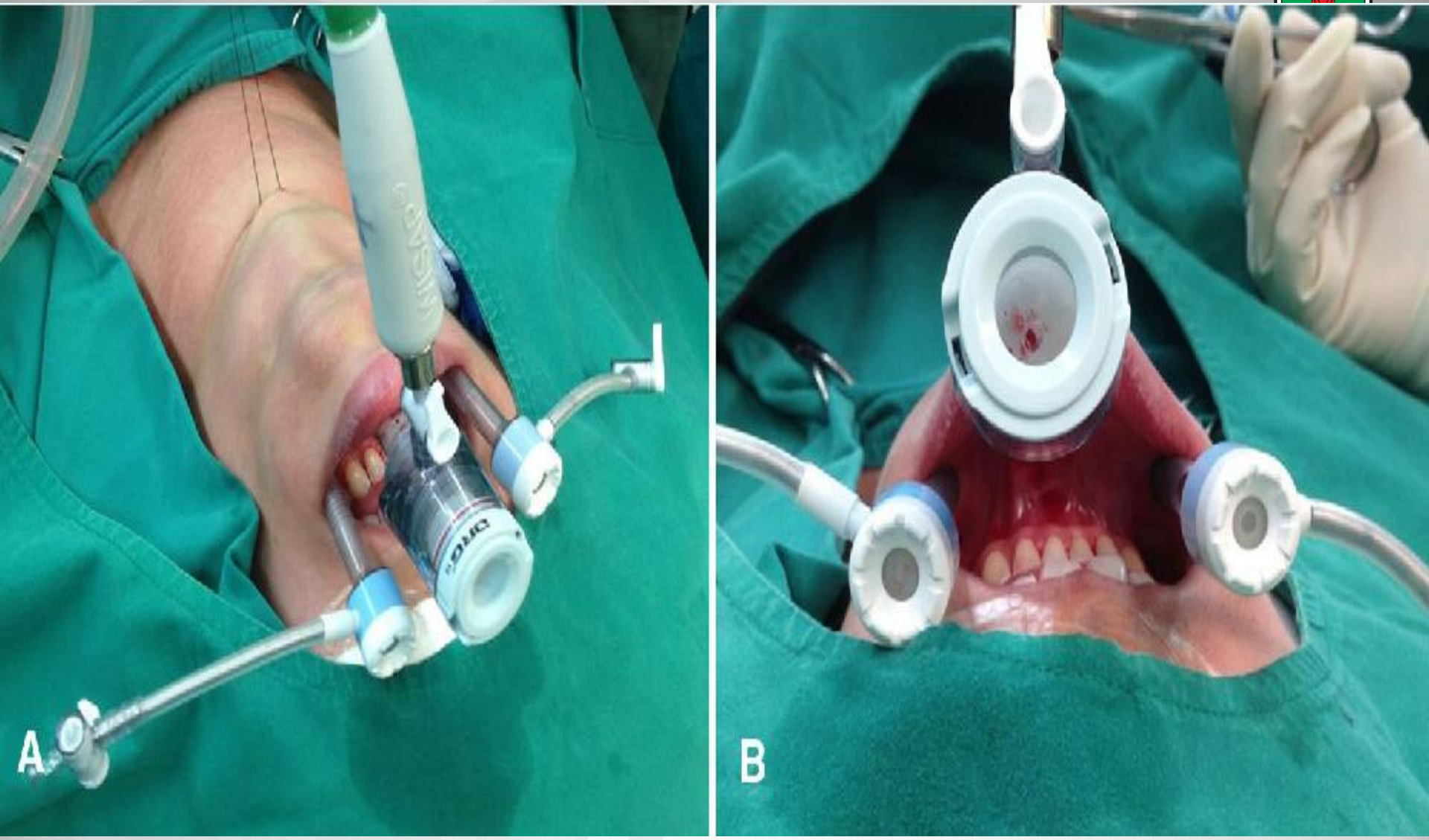
JF Henry Brit J Surg 2006

Wilhelm 2011 (transoral approach)




CM 1 2 3 4 5 6
INCHES 1 2




A
B

REVIEW JSLS

Transoral Endoscopic Thyroidectomy: A Systematic Review of the Practice So Far

Christian Camenzuli, MD, Pierre Schembri Wismayer, MD, PhD, Jean Calleja Agius, MD, PhD

ABSTRACT

Background and Objectives: Thyroid disease largely affects young females, but the incidence is also increasing among males. In an effort to avoid the scarring of the neck that is synonymous with conventional thyroidectomy, endoscopic techniques have been developed over the years. The transoral endoscopic approach is the latest of these innovations that promises a scarless surgical outcome. This review evaluates whether this technique is safe and feasible in live patients and outlines the outcomes in published literature so far.

Database: PubMed, Medline, BioMed Central, Cochrane Library, OVID and Web of Science were systematically searched by using a Medical Subject Heading (MeSH)–optimized search strategy. The selection of papers followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines after setting strict inclusion and exclusion criteria. Sixteen studies were included in the final analysis.

Discussion: This systematic review presents cases of 785 patients. Surgeons in 15 of the studies used a completely vestibular approach, whereas those in the remaining 2 used the floor of the mouth for primary access. Conversion to open surgery took place in 1.3%. In total, 4.3% of patients experienced transient laryngeal nerve palsy, whereas 0.1% had permanent recurrent incidences of the condition. Transient hypocalcemia occurred in 7.4% of cases, with no recorded permanent cases. Carbon dioxide embolism occurred in 0.6% of cases, and another 0.6% had a deep-seated neck infection. The complication rates within the review were deemed acceptable and the overall technique feasible. A prospective randomized controlled trial was proposed to compare this technique with conventional thyroidectomy.

Key Words: Natural orifice endoscopic surgery, Oral endoscopy, Scarless, Thyroidectomy, Transoral.

INTRODUCTION

Over the past centuries, procedures to surgically remove all or part of the thyroid gland from the neck have gone from infamy to fame. What Samuel D. Gross in the 19th century considered to be "horrid butchery," through the brave work of surgeons like Emil Theodor Kocher, has become one of the most common and safest of surgeries.[1–3] The gold-standard approach for thyroidectomy has been open or conventional surgery. Recently, there has been increased interest in applying the principles of minimally invasive surgery to thyroid surgery. This development was initially promoted by Miccoli and his colleagues[4] in 1999 and has continued to expand and improve throughout recent years. The aims of minimally invasive surgery include better cosmesis and earlier recovery without compromising the excellent results achieved with open surgery.[5] The approaches taken in thyroid surgery include mainly a transaxillary approach with later additions of areolar, anterior chest wall, and mixed approaches.[6–10] The extent of dissection and difficulty of these procedures despite robotic help has limited the uptake of these techniques.[11,12]

The transoral endoscopic technique, an adaptation of the concept of natural orifice transluminal endoscopic surgery (NOTES) to the neck, is a technique that promises to improve the aesthetic aspect by offering a scarless operation while retaining the advantages of minimally invasive surgery.[13,14] The pioneers of this technique were the group led by Witzel and his colleagues,[15] who presented their first paper on the subject in 2008. In their study on cadavers and live pigs, they managed to present a proof of concept that formed the basis for the extensive work that is being carried out by multiple groups around the world.

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Disclosures: none reported.

Informed consent: Dr. Camenzuli declares that written informed consent was obtained from the patient/s for publication of this study/report and any accompanying images.

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Till 2018

- 16 Reported series with a sum of 785 patients of which 713 (91%) were female and 68 (8%) were male.
- Anuwong et al (Thailand) 422 pts.
- Wilhelm et al (Germany) 96 pts.
- Fu J et al (China) 81 pts.
- Yang J et al (China) 46 pts.
- Other centers 130 pts.

- This systematic review presents cases of 785 patients. Surgeons in 15 of the studies used a completely vestibular approach, whereas those in the remaining 2 used the floor of the mouth for primary access. Conversion to open surgery took place in 1.3%. In total, **4.3%** of patients experienced **transient laryngeal nerve palsy**, whereas 0.1% had permanent recurrent incidences of the condition. Transient hypocalcemia occurred in 7.4% of cases, with no recorded permanent cases. Carbon dioxide embolism occurred in 0.6% of cases, and another 0.6% had a deep-seated neck infection.

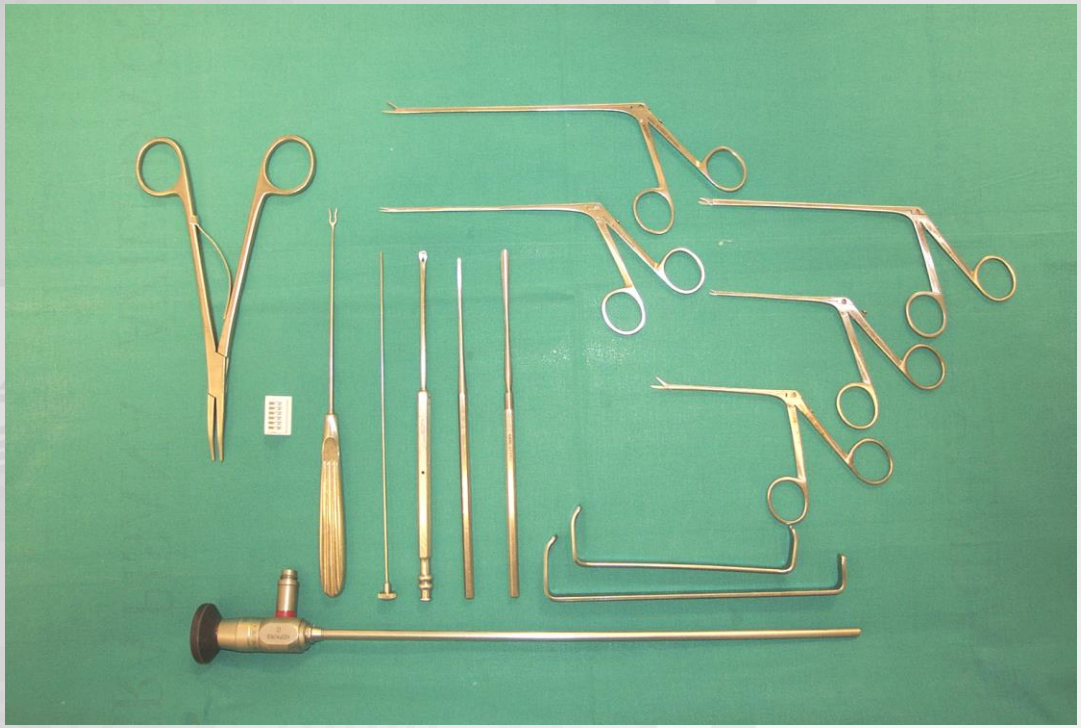
→ higher than conventional

* also they found no change in satisfaction levels bet. conventional & minimally invasive cuz pts who do minimally invasive usually have higher expectations!

Miccoli (MIVAT) 1998

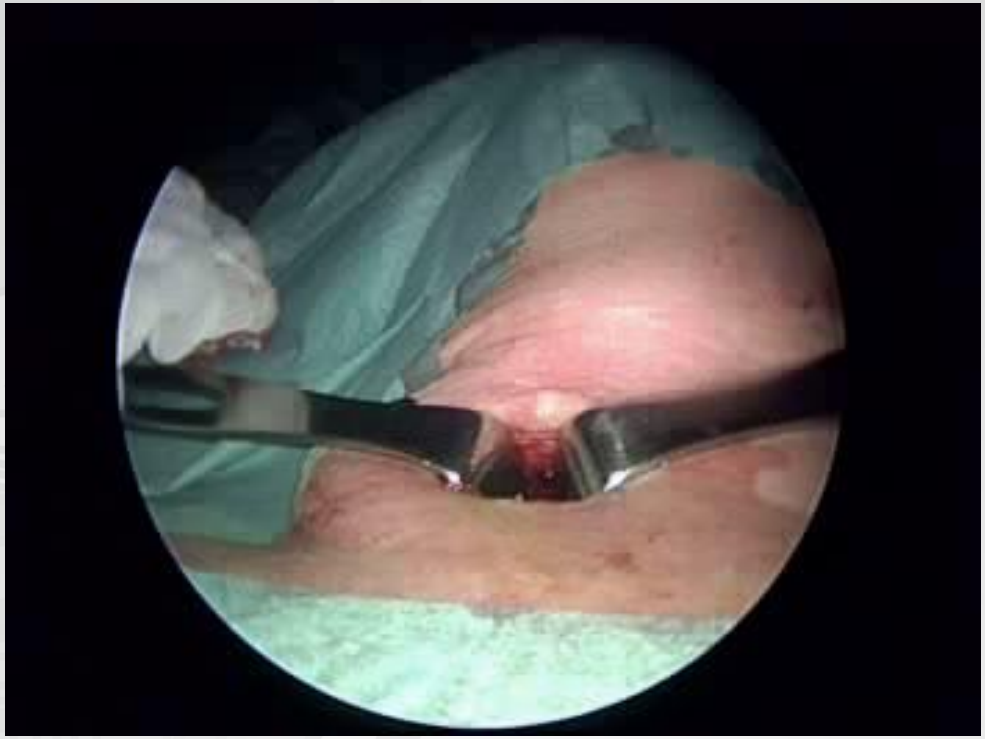
Patient in supine position
Neck not extended
Skin covered by drape

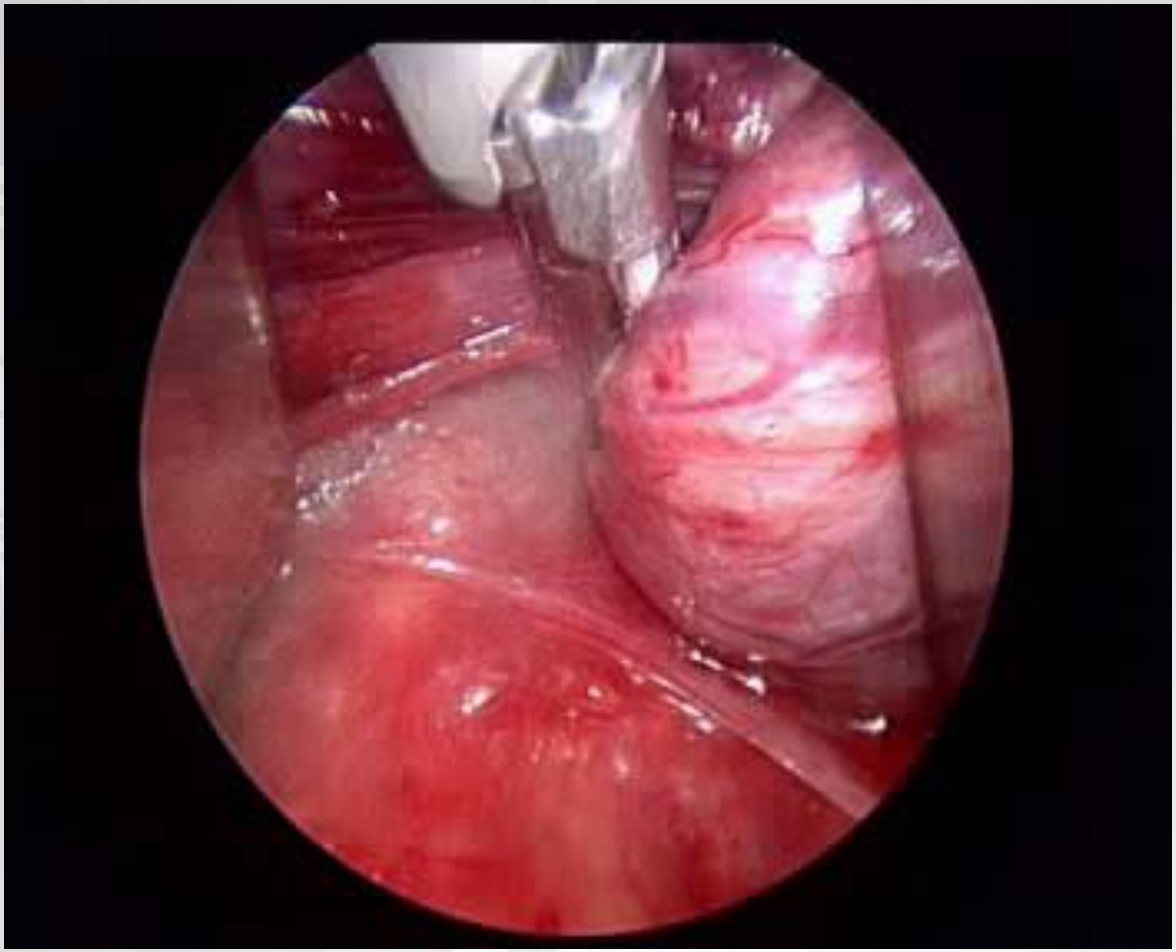
MIVAT: Instrumentation

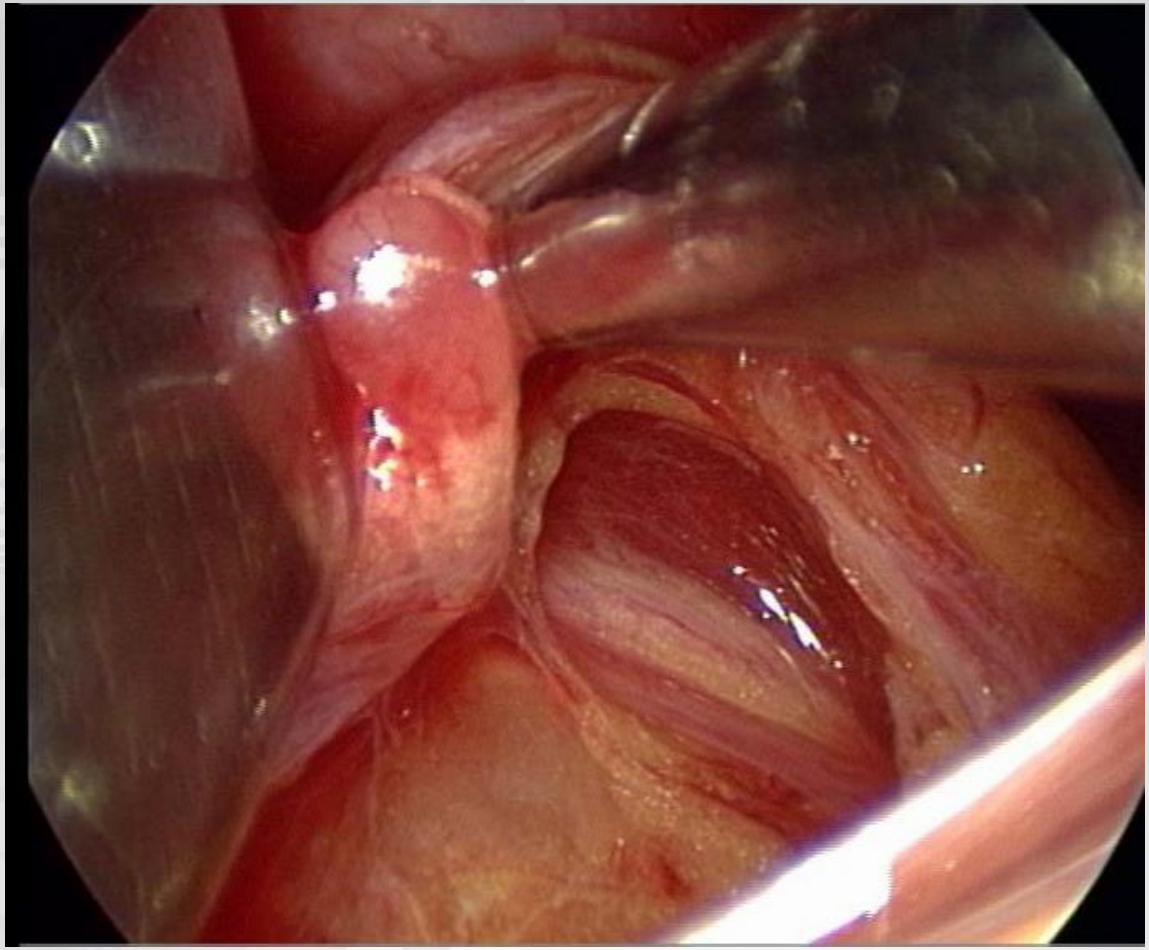


30° 5mm endoscope
Spatulas (2mm)
Spatula-aspirator
Scissors (2mm)
Forceps (2mm)
Retractors
Clip applier
Harmonic Scalpel

MIVAT Incision

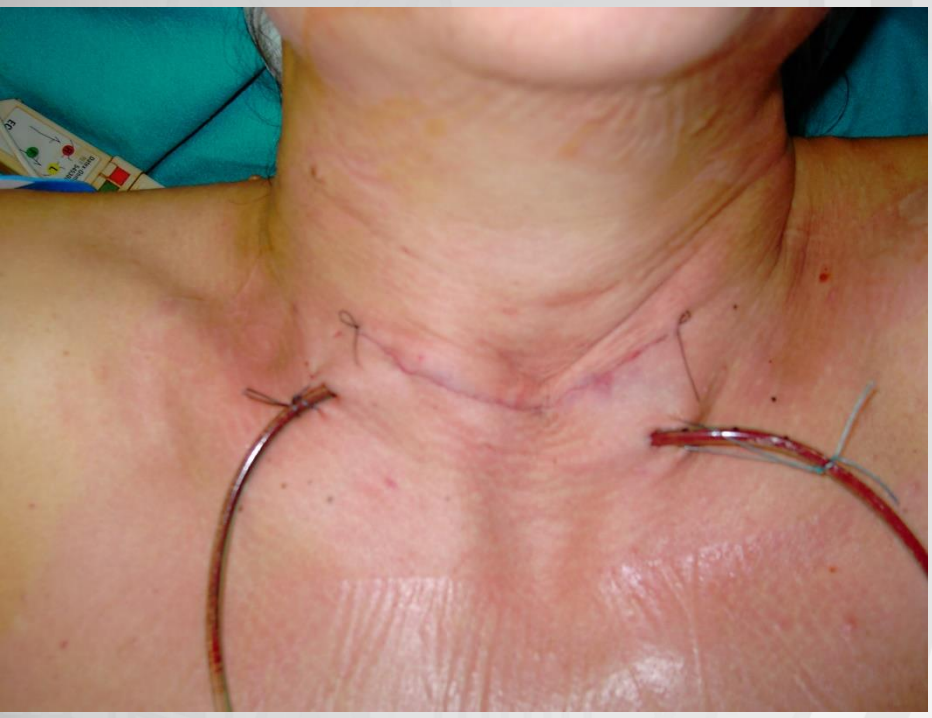






INCLUSION CRITERIA

- Nodule less than 3.5 cm
- Thyroid volume less than 20 ml (ultrasound measured)
- No lymphnodes
- No thyroiditis



Open
(conventional)

minimally invasive

COMPLICATIONS

- 18 transient laryngeal nerve palsy (1.8 %)
- 9 perman. laryngeal nerve palsy (0.9 %)
- 18 transient hypoparathyroidism (2.2 %)
- 3 permanent hypoparathyroidism (0.6%)

same rate in multicentric studies comparable to standard surgery

World J Surg 2002

American Thyroid Association Statement on Remote-Access Thyroid Surgery (2016)

- Remote-access thyroidectomy has a role in a small group of patients who fit strict selection criteria. These approaches require an additional level of expertise, and therefore should be done by surgeons performing a high volume of thyroid and robotic surgery.

Pros

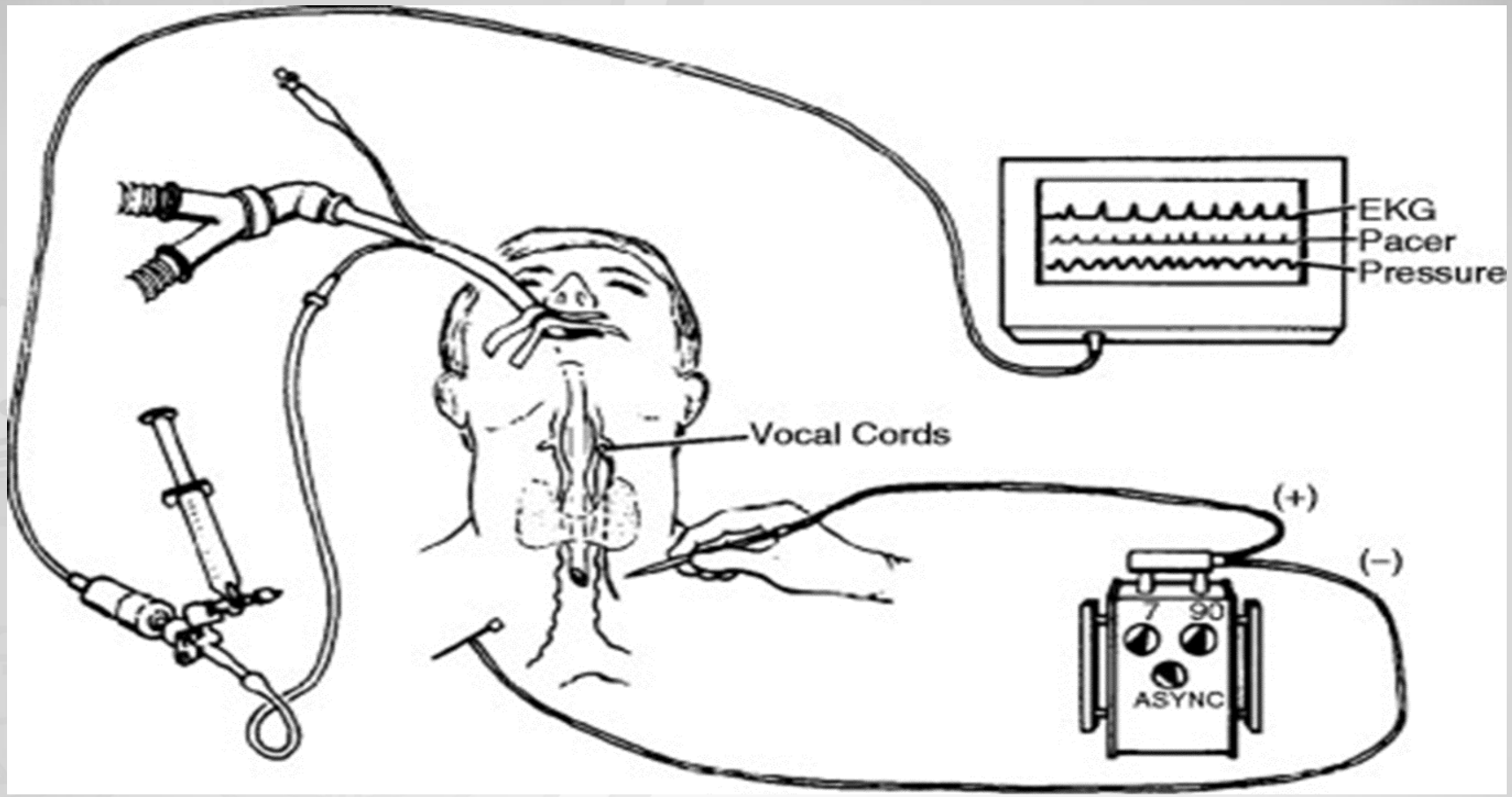
- Cosmetic outcome.
- Tissue injury.

Cons

- Visualization and field.
- Tactile sensation.
- Transient complications.
- Remote dissection.
- Oncological outcome.
- Cost effectiveness.

Nerve monitor

how to identify recurrent laryngeal nerve?
We do N stimulation which moves vocal cords → monitor shows electrical gram



Thank You