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IN SITU PRESERVATION OF PARATHYROID GLANDS DURING THYROID SURGERY

Nada Santrac, MD, PhD(c)

SERBIA

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NO CONFLICT OF INTEREST

INTRODUCTION

- **Thyroid surgery is the surgery of the laryngeal nerves and parathyroid glands (PTGs).**

- **Hypoparathyroidism (HPT) is one of the most frequent and severe complications of thyroid surgery.**
- **It is caused by:**
  1) **intraoperative damage of PTGs,**
  2) **devascularization of PTGs,**
  3) **accidental removal of PTGs**

- **The incidence of postoperative HPT is directly proportional to surgery extent and surgeon's experience.**

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SURGERY EXTENT

- **Incidence of postoperative HPT is highest in patients with malignancy that undergo TT and CND.**
- **Giordano et al. in 2012 reported incidence of 52% for transient and 16% for permanent HPT in patients with bilateral CND.**
- **Locally advanced thyroid carcinomas and reoperations carry significantly higher risk for HPT.**

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SURGEON'S EXPERIENCE

- **The surgeon is the most important factor of prognosis, both for outcome and postoperative complications.**

- **Arterial blood supply interruption → PTG ischemia**
- **Venous drainage disruption → stasis and PTG infarction**

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PREVENTION OF HPT during thyroid surgery

- **IN SITU PTG PRESERVATION ON ADEQUATE ARTERIAL AND VENOUS VASCULARIZATION is crucial for proper PTG function and prevention of HPT.**
- **AUTOTRANSPLANTATION OF PTGs due to vascular or oncological reasons**
- **IMPORTANT: reported success of autotransplantation differs!!**

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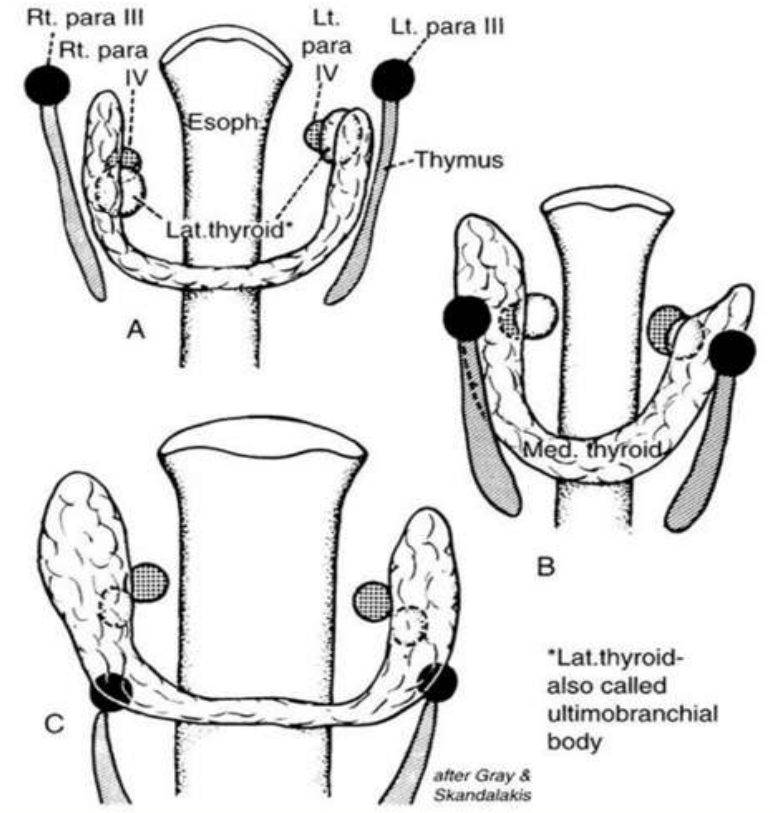
EMBRIOLOGY OF PTGs



- Complex embriogenesis
- ENDODERM of 3rd (INFERIOR PTGs) and 4th (SUPERIOR PTGs) pharyngeal pouch, with vertical shift
- **VARIATIONS in position!**

EMBRIOLOGY OF PTGs

4th pouch → dorsal: SUPERIOR PTGs

→ ventral: ultimobranchial body

- **horizontal migration to lateral lobes**
- **localization: posterolateral position, cricothyroidal junction, upper-mid third of LL, 1cm above intersection of ITA and RLN**
- **variables: intrathyroidal, retropharyngeal, retroesophageal, posterior mediastinum**

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EMBRIOLOGY OF PTGs

3rd pouch → dorsal: INFERIOR PTGs

→ ventral: thymus

- **vertical migration to lateral lobes**
- **localization: anterolateral position, lower poles of LL**
- **variables: parathymus, incomplete descensus, thyrothymic tract, intrathymic, intrathoracal, upper anterior mediastinum**

VASCULARIZATION OF PTGs

ARTERIAL VASLULARIZATION

- **Inferior thyroid artery**
  missing in 10%, commonly on the left side (Delattre 1982)
- **Superior thyroid artery - posterior branch**
- **ITA-STA anastomotic Halsted arcade**
- **Thyroid ima artery**

VENOUS VASCULARIZATION

- **Inferior thyroid vein (60%)**
- **Middle (Kocher) thyroid vein (30%)**
- **Superior thyroid vein (10%)**

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IN SITU PRESERVATION OF PTGs
– HISTORICAL OVERVIEW –

1) HALSTED and EVANS, 1907: PTG vascularization

2) THOMPSON, 1973: CAPSULAR DISSECTION, 2% PHPT

3) ATTIE and KHAFIF, 1975: PRESERVATION OF ARTERIAL PEDICLES, magnification, 3.2% PHPT

4) SCHWARTZ and FRIEDMAN, 1987: ATTIE technique, no magnification, PTG CAPSULE PRESERVATION, 3.3% PHPT

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IN SITU PRESERVATION OF PTGs
– HISTORICAL OVERVIEW –

5) **DZODIC, 1993: LIGATION CLOSE TO THYROID CAPSULE, MANDATORY PRESERVATION OF VENOUS BLOOD VESSELS (Kocher's vein trunk and vein branches that accompany the posterior branch of STA and ITA trunk)**

6) **LEE, 2014: preservation of INFERIOR THYROID VEINS bilaterally during central neck dissection**

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THE AIM

**TO PRESENT ORIGINAL TECHNIQUE OF
IN SITU PRESERVATION OF PARAHTYROID GLANDS
DURING THYROID SURGERY
AND 40-YEARS-EXPERIENCE RESULTS
IN POSTOPERATIVE HYPOPARATHYROIDISM**

SURGICAL TECHNIQUE

(1) meticulous, atraumatic

(2) bloodless surgical field

(3) use of suction is not recommended

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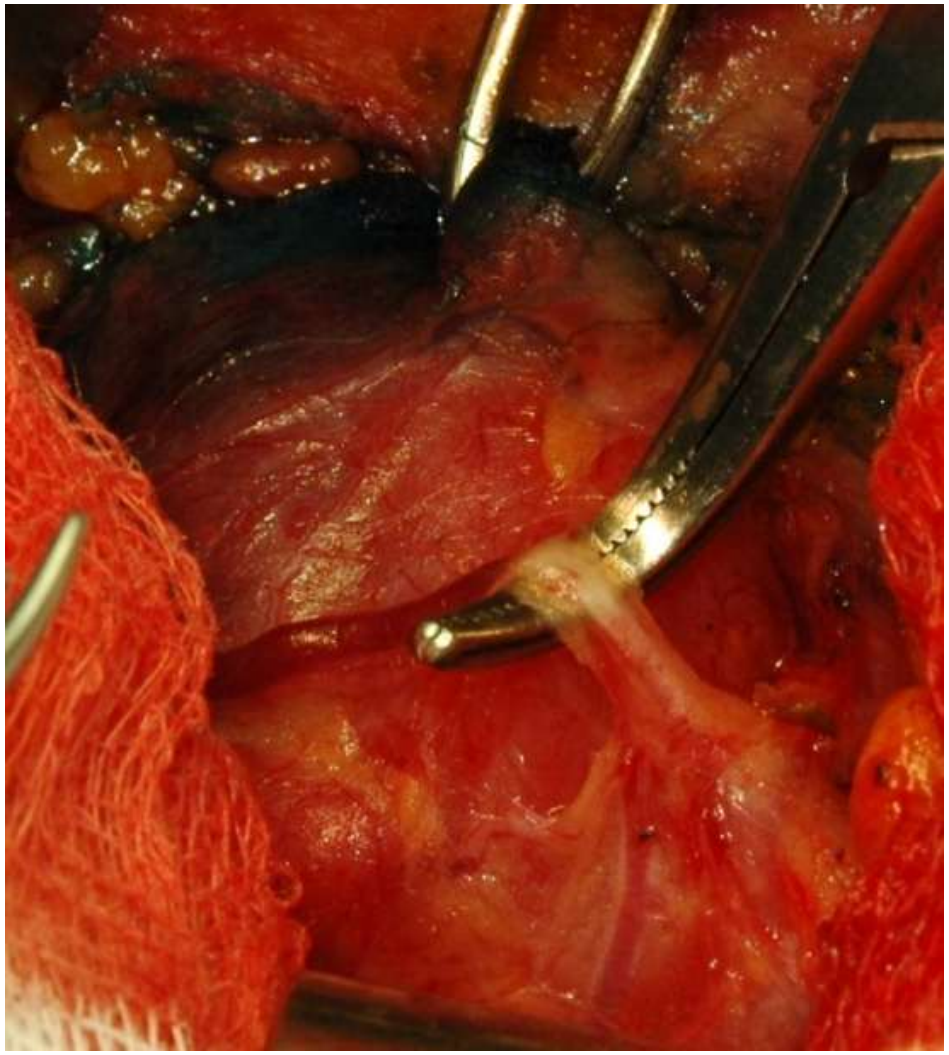
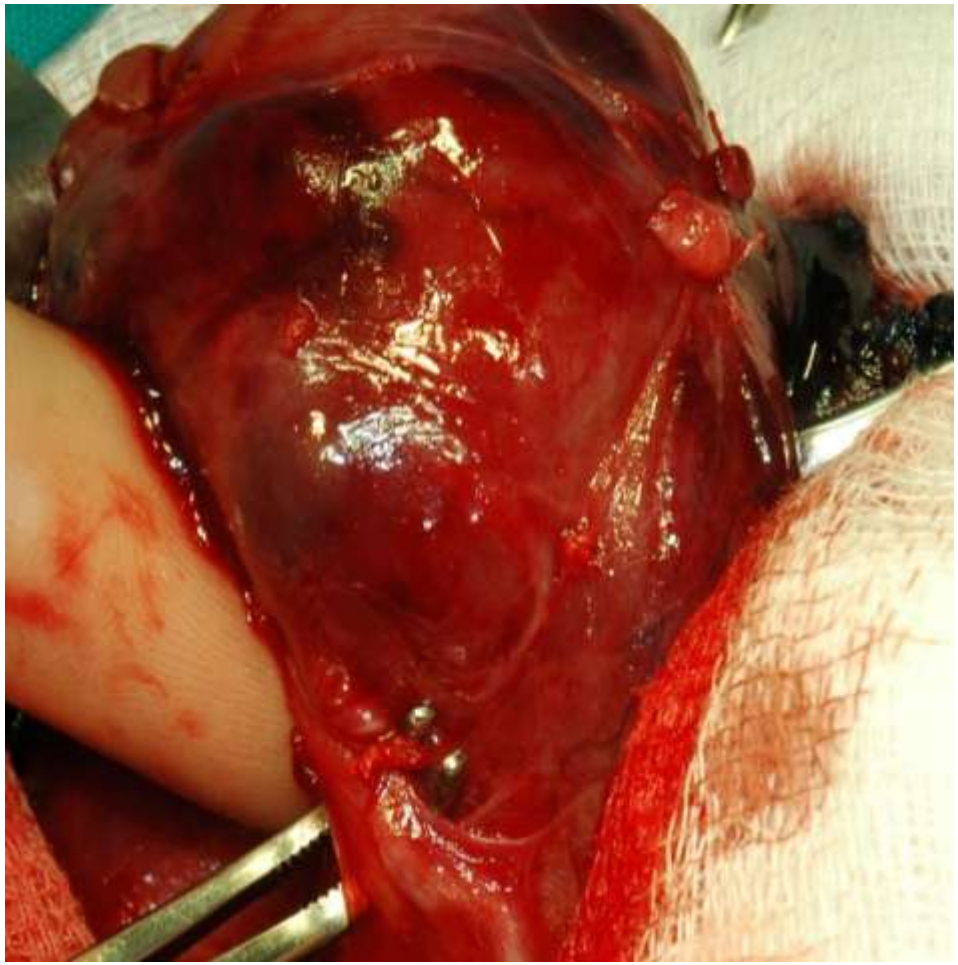


capsular dissection and ligation of arteries and veins as close as possible to the thyroid capsule (Kocher`s vein)



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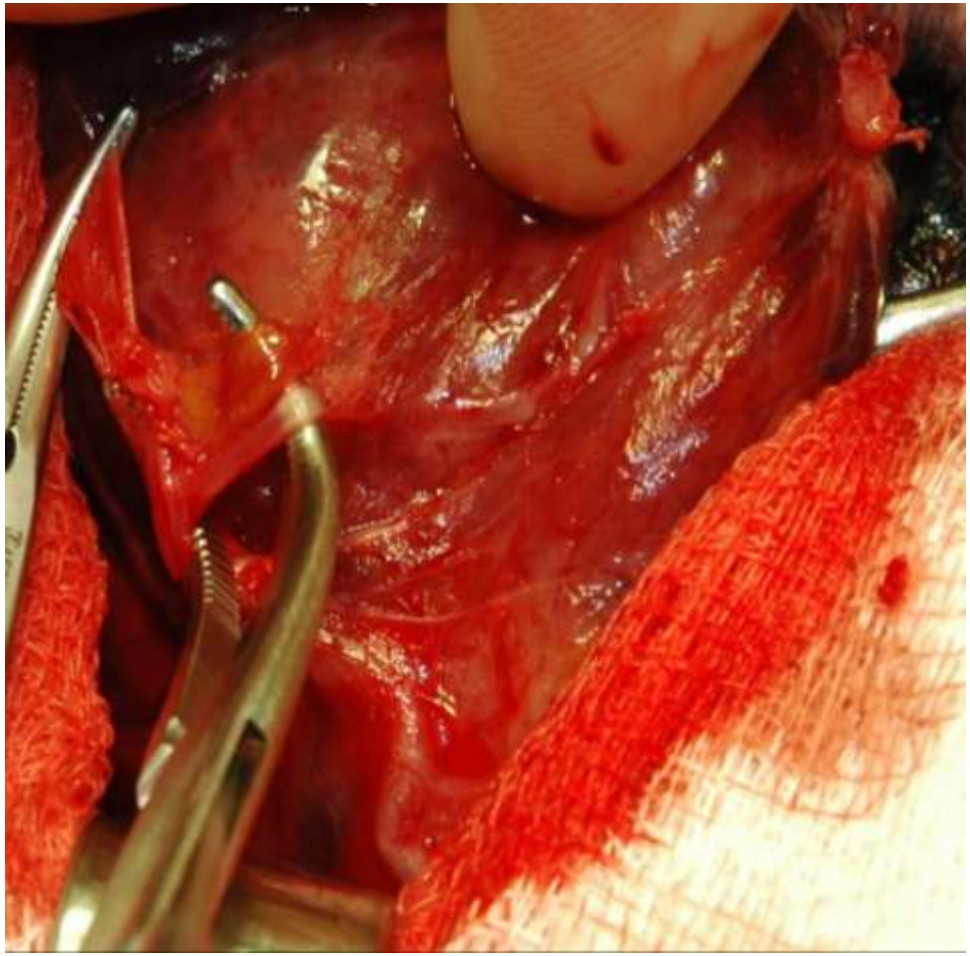

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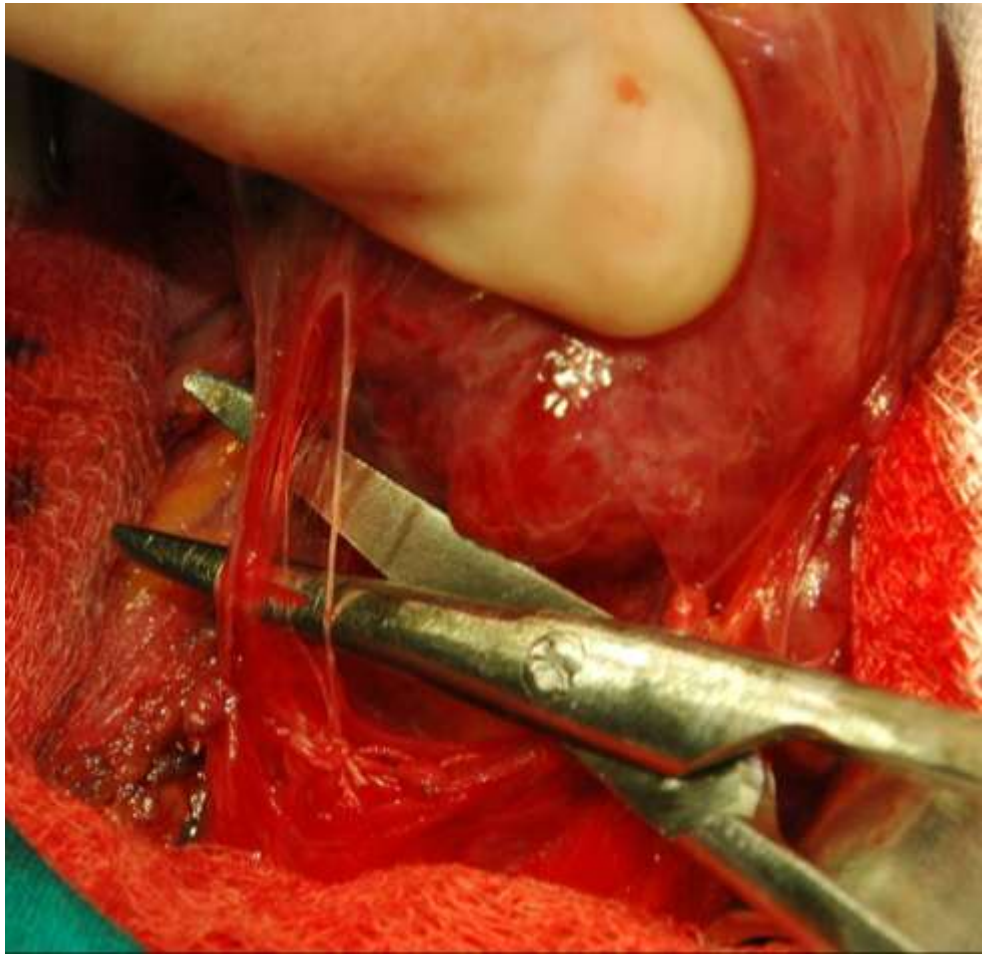

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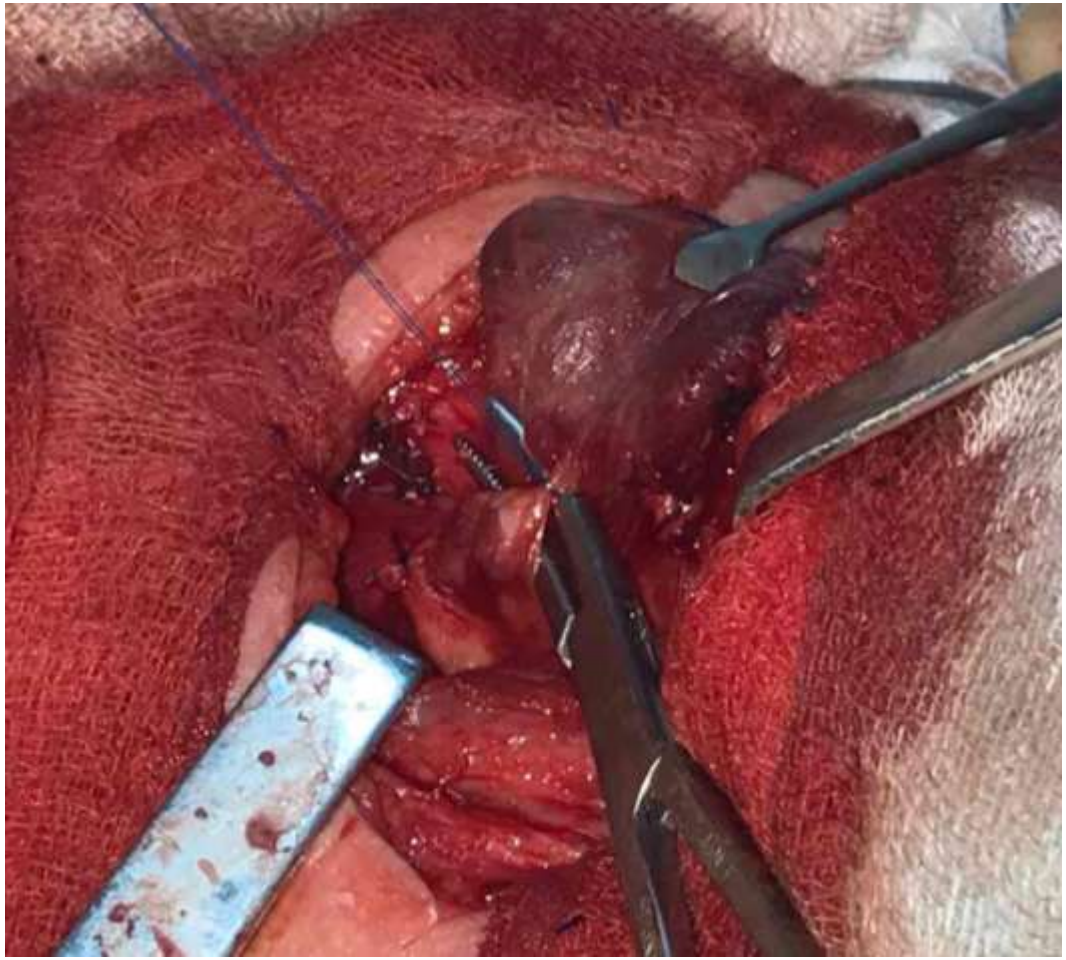

PTG de-attachment from thyroid capsule on vascular pedicle, without significant dislocation

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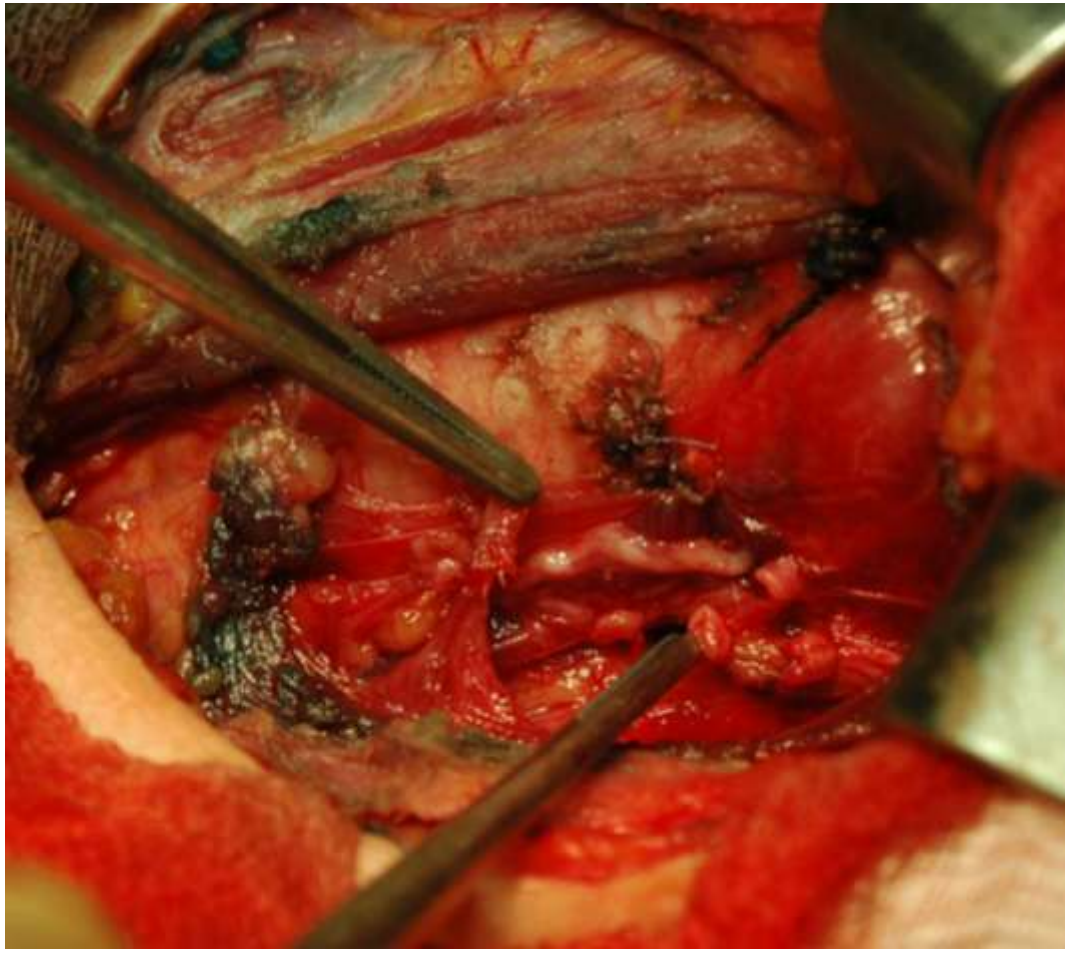

PTG de-attachment from thyroid capsule on vascular pedicle, without significant dislocation

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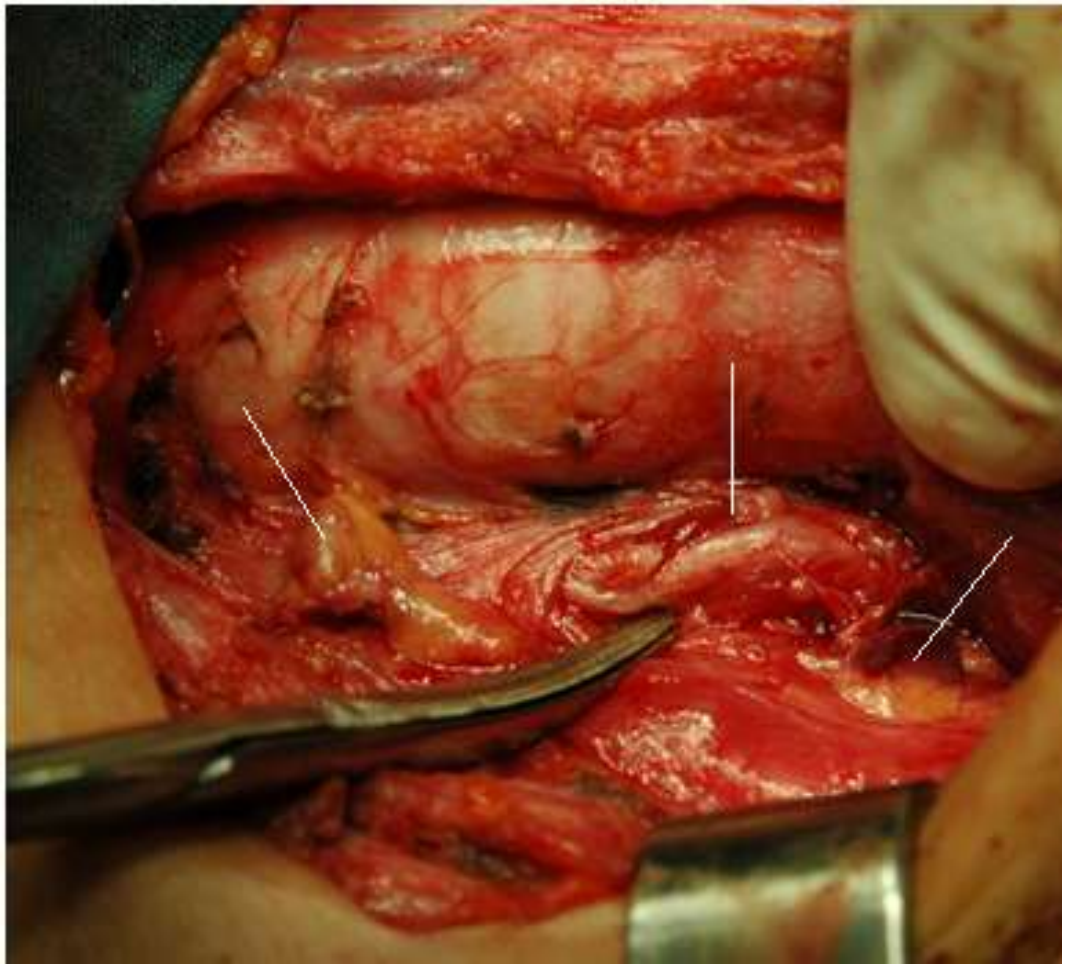
PTG de-attachment from thyroid capsule on vascular pedicle, without significant dislocation



PTG de-attachment from thyroid capsule on vascular pedicle, without significant dislocation

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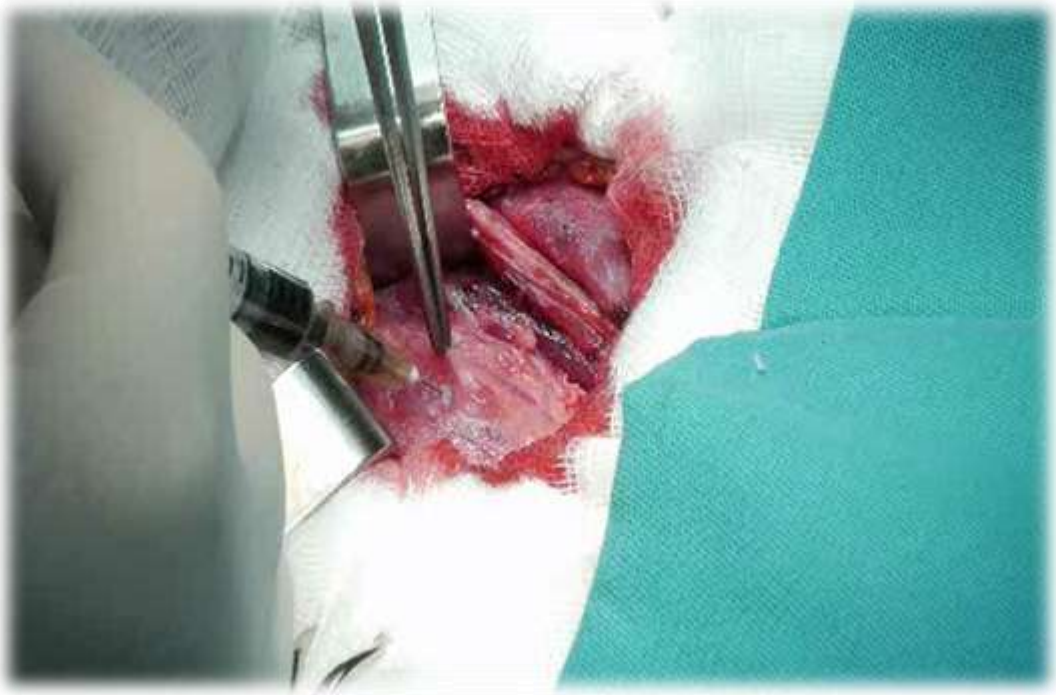
PRACTICAL TIP

METHYLENE BLUE DYE thyroid injection for sentinel lymph node biopsy



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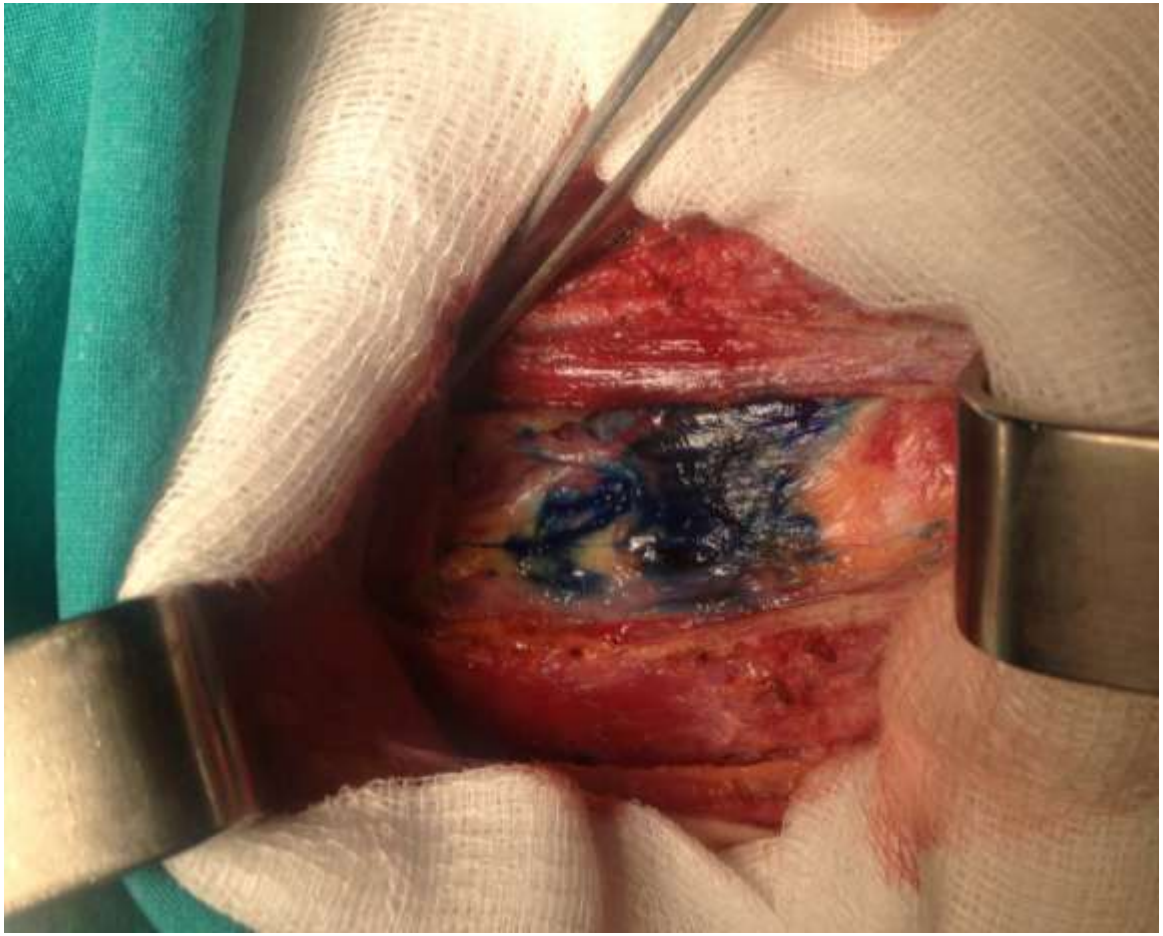
Central lymph nodes are colored in blue



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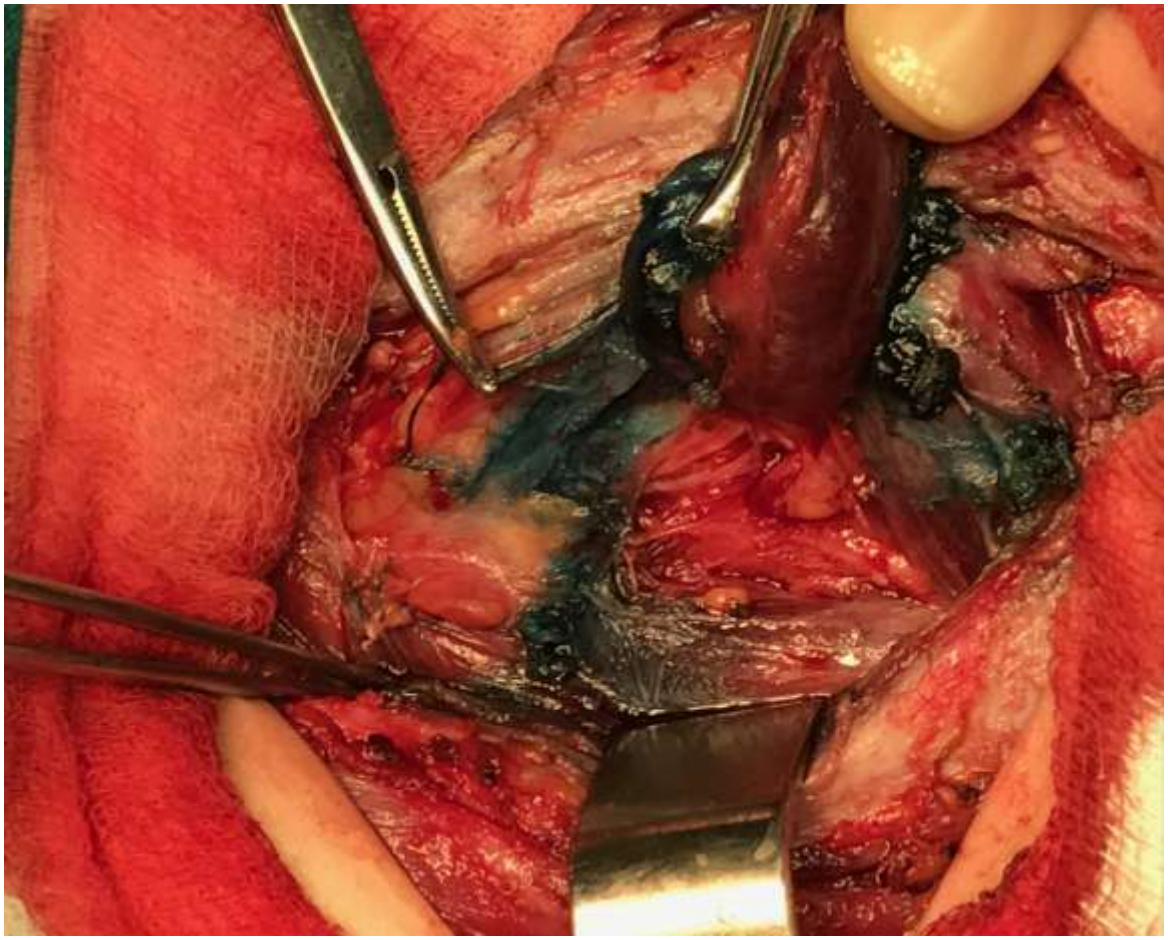
PTGs remain non-colored



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PRACTICAL TIP

METHYLENE BLUE DYE thyroid injection for sentinel lymph node biopsy:

→ Central lymph nodes are colored in blue

→ PTGs remain non-colored

EASY IDENTIFICATION and PRESERVATION of PTGs during CENTRAL NECK DISSECTION

RESULTS

After 40 years of experience in thyroid surgery, and several thousands of preserved PTGs, a total prevalence of permanent HPT in this personal series is less than 0.5%.

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CONCLUSION

Following given key points and recommendations to surgical in situ preservation of PTGs, a surgeon can provide good outcome for patients after total thyroidectomy (with or without CND), regarding hypoparathyroidism as one of the most severe complications of thyroid surgery.

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A SURGEON SHOULD SAVE EVERY AND EACH PARATHYROID GLAND AS IF IT IS THE ONLY ONE

Dzodic R, Santrac N.
In situ preservation of parathyroid glands: advanced surgical tips for prevention of permanent hypoparathyroidism in thyroid surgery. **J BUON 2017** Jul-Aug;22(4):853-855.

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16th Biennial Congress of Asian Association of Endocrine Surgeons is pleased to award

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Chairman LOC

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THANK YOU

Radan Dzodic, Serbia radan.dzodic@gmail.com

Nada Santrac, Serbia santrac.nada@gmail.com