سورة طه الاية (114)

Acknowledgments

*I Praise **Allah** Thank Him, Seek His Help, Guidance and Forgiveness … then:*

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INTRODUCTION

Thyroidectomy is one of the most commonly performed elective surgical procedures done nowadays. The complications following thyroidectomy are well known, some of them are fatal, others are quite disturbing particularly in their permanent form, however one of the most common immediate surgical complications following thyroidectomy is hypocalcaemia (***Thomusch et al., 2000).***

Hypocalcaemia from hypoparathyroidism is a well-recognized complication of thyroidectomy. It might be permanent in up to 10%, and temporary in up to 50%, of patients. It can take up to four days to reach its nadir, and can lengthen a patient's hospital stay considerably. **(Lee et al., 2010).**

Hypoparathyroidism is a challenging event after thyroidectomy because of the lack of objective data for verifying intraoperative viability of parathyroid glands and

reliable parameters for predicting postoperative hypocalcaemia and related symptoms. In the past few years, close monitoring of serum calcium level, requiring repeated blood sampling, has been recommended to prevent postoperative hypocalcaemia. **(*Quiros et al., 2005*)**.

Early postoperative hypocalcaemia may, in fact, be a result of preoperative haemodilution. Furthermore, the lowest calcium level is seldom reached until 24–48 hours after surgery, and this may partially restrict the planning of asafe, early discharge. The option of treating all patients with calcium therapy to reduce postoperative length of stay may not appear to be the proper solution. Only selected cases require replacement therapy, and overtreatment may inhibit parathyroid function. **(*Fahmy et al., 2004*)**.

Close monitoring of postoperative calcium concentrations is usually recommended after different thyroid operations. However, in the literature, little guidance is found on the optimal method of surveillance for the

majority of patients subjected to thyroid surgery. **(Barczy'nski et al., 2010).**

Recently the PTH assessment which has been used in parathyroid surgery for more than two decades was introduced as an early predictor of parathyroid dysfunction in thyroidectomized patients. **(*Warren et al., 2004*).**

The presumed cause of hypocalcaemia after thyroidectomy is multifactorial. Some investigators have shown that hypocalcaemia is more likely to occur in the setting of bilateral thyroidectomy, procedures requiring parathyroid auto transplantation, thyroid malignancy, and substernal thyroid gland extension. **(*Cooper et al., 2008)***

Aim of work

This study aims to discuss the incidence of post thyroidectomy hypocalcaemia following different modalities of thyroid surgeries as well as illustrate the diagnosis, treatment and prevention of such disturbing complication.

SURGICAL ANATOMY AND EMBERIOLOGY OF THE THYROID GLAND AND ITS RELATED STRUCTURES

If morbidity during and following thyroid surgery is to be minimized or avoided, and if high rates of success are to be achieved in restoring normocalcaemia in patients undergoing thyroid surgery, surgeons must have detailed knowledge of the anatomy and embryology of the thyroid and parathyroid glands. The surgeon must be fully prepared to apply that knowledge during the course of operations on those organs (**Arlie et al.; 2010).**

EMBRYOLOGY OF THE THYROID GLAND

Thyroid development is detectable in the third week of gestation. The thyroid is primarily derived from the endoderm. The ventral portion of the fourth pharyngeal pouch will develop into the lateral thyroid lobes **(Mann et al ., 1995)**.

The pyramidal lobe, present in up to 55 % of patients, originates from the migration of the thyroglossal duct that descends from the pharynx at the foramen cecum of the tongue and attaches to the thyroid isthmus. The thyroglossal duct is usually obliterated after its descent. If it remains patent, the patient may develop a thyroglossal duct cyst **(Braun et al, 2007)**.

The ultimobranchial bodies (transient embryonic structures) consist of neural crest cells from the fourth and fifth bronchial pouches, which migrate to the upper third of the thyroid lobes. The neuroendocrine parafollicular cells (C cells), derived from the ultimobranchial bodies, produce calcitonin. The ultimobranchial bodies fuse with the posterior lobes of the thyroid. C cells make up only about 0.1 percent of the thyroid mass and are concentrated in the upper thyroid lobes. Multicentre hyperplasia of the parafollicular C cells is a precursor lesion of medullar thyroid cancer and a hallmark of multiple endocrine neoplasia type 2 (MEN2) **(Braun et al .,2007)**

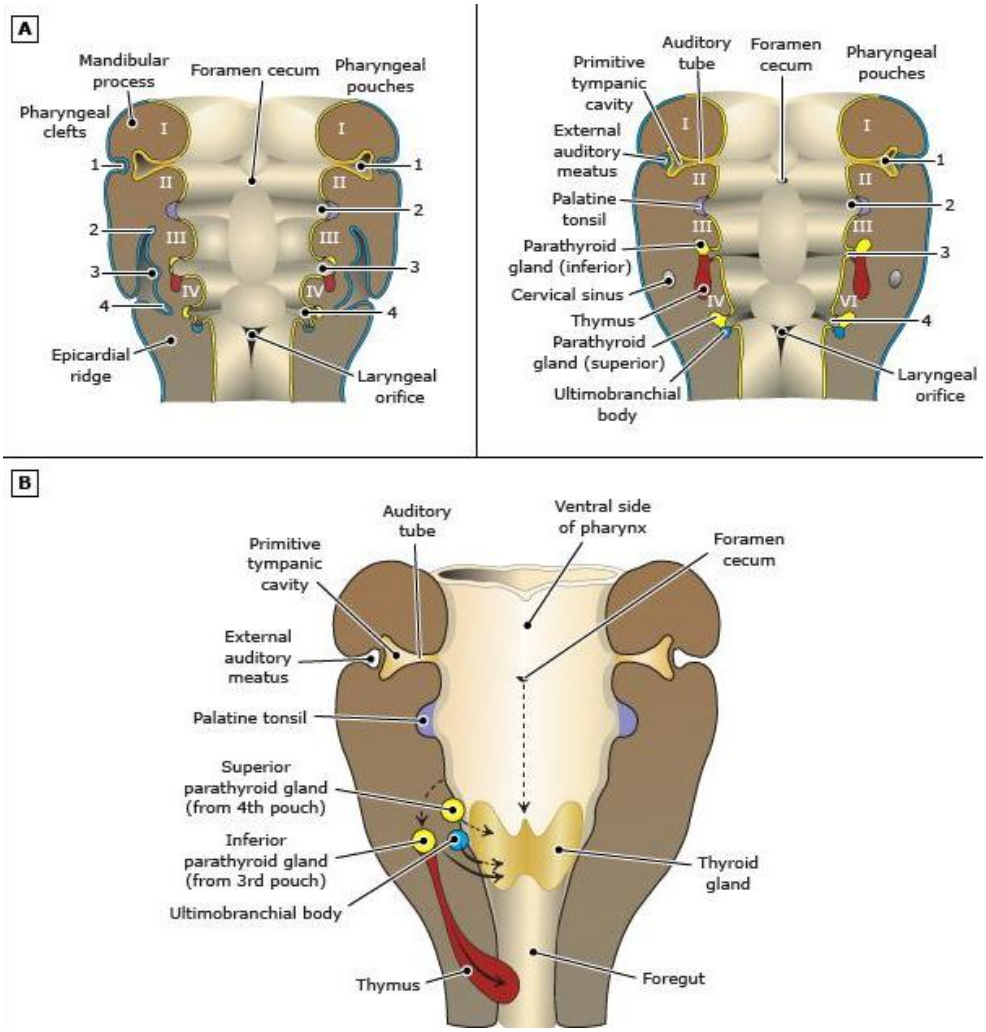

Figure 1: Coronal views of pharyngeal arch transformations parathyroid glands and critical immunologic tissue (the thymus gland) develop from involutions of the third and fourth pouches. From the midline of the ventral pharynx, the thyroid gland originates from the lining of the foramen cecum and descends external to the gut tube **(quoted from Williams & Wilkins)**.

SURGICAL ANATOMY OF THE THYROID

Size and location

The thyroid gland weighs 10 to 20 grams in normal adults and it is one of the most vascular organs in the body. The normal thyroid gland is immediately caudal to the larynx and encircles the anterolateral portion of the trachea. The thyroid is bordered by the trachea and esophagus medially and the carotid sheath laterally. The sternocleidomastoid muscle and the three strap muscles (sternhyoid, sternthyroid and the superior belly of the omohyoid) border the thyroid gland interiorly and laterally. There are many anatomic variations in thyroid gland shape and extent. Conditions such as thyroiditis, malignancy, goiter, substernal goiter, hypothyroidism, prior cervical surgery, and prior radioiodine ablation can significantly distort , enlarge , or shrink the thyroid gland and / or obscure its anatomic borders **(Bliss et al.,2000)**.

Thyroid lobes

The thyroid has two parts or lobes that are connected by the thyroid isthmus, a narrow band of thyroid tissue. The thyroid lobes extend from the isthmus superiorly to the mid-