



PEDIATRIC SURGERY *Update**

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Thyroid Pediatric Cancer: Role of CLND

Papillary thyroid differentiated cancer (PTC) is the most common malignancy of the thyroid gland in children. It carries an excellent overall prognosis after surgical and radioiodine (RAI) management in most cases. PTC is associated with neck metastasis in more than 60% of cases along with multifocality at the time of primary diagnosis in children. There is a higher incidence of distant metastasis in children as opposed to adults. The spread of PTC to regional lymph nodes appears to occur in a sequential pattern from the thyroid to the central compartment (Level VI and VII) and then to the ipsilateral compartment (Levels II, III and IV). Data of centers who use routine central lymph node dissection (CLND) during total thyroidectomy for PTC have found: Around 50-60% of those 'node-negative' metastasis are in the central compartment of the neck rarely diagnosed using FNA. They can even occur in PTC with microcarcinomas (less than 10 mm tumor sizes). Cervical lymph node involvement in PTC does not affect overall survival as residual metastatic disease can be managed effectively with RAI. CLND can be performed without extension of the thyroidectomy. Routine CLND allows accurate staging of the disease. Prophylactic lateral neck dissection for patients with PTC is generally not recommended. Complications after CLND include injury to parathyroid glands, recurrent laryngeal nerve injury, superior laryngeal nerve injury and hematoma/seroma. CLND is recommended at the time of initial surgery for children with identified preoperative nodal metastasis. Since CLND decreases the risk of residual or recurrent locoregional disease and decrease the overall disease burden the efficacy of RAI treatment is increased. The most important deterrent toward prophylactic CLND in PTC in children is the high incidence found of postoperative transient vocal cord paralysis and permanent hypoparathyroidism identified. The use of neuromonitoring and higher expertise in thyroidectomy can reduce the incidence of complications. For children with clinical evidence of gross extrathyroidal invasion, locoregional metastasis on preop evaluation and/or suspicious intraoperative lymph nodes CLND is recommended to increase disease free survival. The lymph node ratio (number positive node/total nodes removed) greater than 0.45 correlates with a high risk for locoregional recurrence. Prophylactic CLND decrease overall tumor burden, guides toward lymph node ratio hence extent of disease and increase the efficacy of RAI improving survival in those children with positive nodal metastasis. Total thyroidectomy with CLND is the most efficient procedure permitting accurate staging and guiding further RAI therapy.

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Indocyanine Fluorescence for Parathyroid Glands

Indocyanine green is a water soluble anionic amphophilic tricarbo-cyanine dye injected to bloodstream with no adverse effect. It is absorbed by tissue and Fluorescence is detected by specialized scopes and cameras to standard monitors to enable identification, tissue perfusion and vascularization of anatomical structures. Once injected binds to lipoproteins and is rapidly excreted into the bile. Indocyanine green (ICG) enhanced Fluorescence has been utilized during several surgical procedures to identify structure that absorbs and emit fluorescence light such as intraoperative angiography, laparoscopic cholecystectomy, sleeve gastrectomy, colorectal resection and lymph node mapping. During total thyroidectomy devascularization or inadvertent removal of the parathyroid glands causes transitory or permanent hypocalcemia depending on the extent of ischemia or gland involved respectively. Intraoperative fluorescence angiography under near-infrared light after intravenous ICG injection can evaluate parathyroid gland perfusion. ICG should not be used in pregnant patients or those with history of allergy to iodine dyes. ICG is injected at a variable dose of 0.2 to 5 mg/kg. ICG angiography in patients undergoing total thyroidectomy is safe and results suggest an excellent correlation between parathyroid perfusion and function. ICG angiography enables early direct evaluation of the parathyroid glands assisting in selecting patients who could require parathyroid autotransplantation into the muscle when a non-vascularized parathyroid gland is identified. ICG angiography is a good predictor of the absence of hypoparathyroidism after total thyroidectomy in contrast to visual evaluation of the parathyroid gland. If ICG angiography identifies at least one well-vascularized parathyroid gland during thyroid removal the patient will not develop hypocalcemia obviating the need to measure PTH and calcium postoperatively. ICG fluorescence during thyroid surgery increases the rate of identification and preservation of the parathyroid glands resulting in a lower rate of early postoperative hypocalcemia.

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Galactorrhea

Galactorrhea is defined as the production of milk from one or both breasts in nonpregnant females, non-breastfeeding females or men. Galactorrhea can occur in either women or men, may be unilateral or most commonly bilateral, can be profuse or sparse and can vary in color and thickness. The diagnosis is made by physical examination. Sudan IV staining for fat droplets of the nipple discharge can confirm the diagnosis. If blood is present in the galactorrhea fluid, it could be harboring a ductal papilloma or carcinoma and ultrasound of both breasts is indicated. Causes of galactorrhea include medications, street drugs, herbal supplements, oral contraceptives, hyperprolactinemia, hypothyroidism, renal disease, breast stimulation, nerve damage to the chest wall and spinal cord injuries. Cytologic evaluation of milky nipple discharge is not recommended. Serum pregnancy test, prolactin levels and thyroid levels are obtained to rule pregnancy in adolescence females, a pituitary prolactinoma or thyroid disorders respectively. If the child has elevated prolactin levels visual field studies and a head MRI is indicated as a pituitary adenoma might be present. When galactorrhea is associated with normal ovulation, the most likely cause is excessive sensitivity of the breast to normal circulating levels of prolactin. When galactorrhea is associated with amenorrhea, it is likely that the circulating levels of prolactin are significantly elevated. The most common cause of hyperprolactinemia is a prolactin-secreting pituitary tumor. Other causes include use of a dopamine antagonist such as metoclopramide, phenothiazine and risperidone, the use of other neuroactive medications such as selective serotonin reuptake inhibitors, pregnancy, renal, disorders and primary hypothyroidism. Galactorrhea can be suppressed by using dopamine agonist medications such as bromocriptine or cabergoline. The optimal management of galactorrhea should be identifying and managing the underlying cause.

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***Edited by: Humberto Lugo-Vicente, MD, FACS, FAAP**

**Professor of Pediatric Surgery, University of Puerto Rico - School of Medicine,
Rio Piedras, Puerto Rico. Director - Pediatric Surgery, San Jorge Children's & Woman
Hospital.**

**Address: P.O. Box 10426, Caparra Heights Station, San Juan, Puerto Rico USA 00922-
0426.**

Tel (787) 340-1868 E-mail: *titolugo@coqui.net*

Internet: <http://home.coqui.net/titolugo>

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