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FUNCTIONAL OUTCOMES AFTER TOTAL THYROIDECTOMY AND COMPLETION THYROIDECTOMY: HYPOPARATHYROIDISM AND POSTOPERATIVE COMPLICATIONS.

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ABSTRACT

OBJECTIVE: This study aimed to functional outcomes of postoperative complications and hypoparathyroidism in patients who underwent completion thyroidectomy (CT) after thyroid lobectomy or total thyroidectomy (TT) for thyroid malignancy.

MATERIALS AND METHODS: Patients were analyzed for the functional outcomes after completion thyroidectomy and total thyroidectomy with lymph node dissection. We reviewed 70 patients who underwent TT for thyroid malignancy at Mahatama Gandhi Hospital and Medical College, Jaipur from July 2017 to July 2019.

RESULTS: Of the 70 patients, underwent TT. There were 12 male patients and 58 female patients. Transient hypoparathyroidism was observed in 52 patients(74.2%). Permanent hypoparathyroidism was observed in none patient. There were no significant postoperative complication of temporary recurrent laryngeal nerve injury, wound infection, and hematoma in patients.

CONCLUSION: The incidence of transient hypoparathyroidism in was significant in patients.

KEYWORDS : Hypoparathyroidism; Postoperative complication; Total thyroidectomy

INTRODUCTION

Thyroid malignancy range varies from slow growing cancers to virulent cancers. There has been increase in thyroid malignancy in last few decades. In western world, patient present early as micro carcinomas. However in India , presentation is both early and advanced presentation of thyroid cancers. Globally, the annual estimated incidence of thyroid cancer were 230,000 new cases in the year 2012 among women and 70,000 among men . In India, globocon data 2018 suggest 18688 new casaes. The incidence of age-standardized ratio is 0.7 for males (World 1.7) and 1.7 for females (World 6.1).[1]

The main treatment for thyroid cancer is surgery. However equilibrium has to be maintained for the indolent nature of disease with post treatment sequelae. In this study we analysed post treatment complications after total thyriodectomy.

MATERIALS AND METHODS

We analyzed prospectively 7 days morbidity of total thyriodectomy performed between july 2017 to july 2019. The demographic pattern, clinical presentation, treatment details, 7-day morbidity, mortality

All patients were evaluated by clinical examination. Thyroid-specific investigations were done as per the institution policy.[2] These included serum T3, T4, thyroid-stimulating hormone, ultrasound of the neck, fine-needle aspiration cytology (FNAC) of thyroid nodule, computed tomography (CT) with contrast and positron emission tomography with CT when indicated. All patients underwent vocal cord examination before surgery.

Patients underwent total thyroidectomy. The treatment decisions regarding neck dissection and central compartment clearance were taken based on the findings of clinico-radiology, intraoperative assessment, frozen section diagnosis and poor prognostic features of the thyroid cancer. The majority of our patients had advanced tumors and underwent a prophylactic central compartment clearance. Any devascularized gland was auto trans planted into the sternoc leidomastoid muscle The 7-day morbidity was documented in the surgical audit. Major complications were defined as any patient developing vocal cord palsy, who required intravenous calcium supplementation, or surgical reexploration under general anesthesia. Minor complication was defined as any patient who required only oral calcium supplementation or conservative management for any complication without a prolonged hospital stay.

Patients symptomatic for hypocalcaemia were classified as those requiring intravenous calcium preparation or oral supplements alone depending on the severity of symptoms along with corrected calcium levels. None of the patients were given calcium preoperatively as a prophylaxis or treated empirically with oral calcium supplements. None of the patients were given any vitamin D supplementation preoperatively. Ionized calcium or parathyroid hormone assay was not done to assess hypocalcaemia. All patients were postoperatively assessed for vocal cord mobility.

Histopathology was reported for all patients.

RESULTS

Total of 70 surgical procedures were analyzed for surgical morbidity.

Surgical morbidity There was no 7days mortality. The major complications included patients who required intravenous calcium supplement 5 patients (3.5%), RLN palsy2 patients (2.8%). Patients requiring only oral calcium supplementation 47 patients (67.1%) and conservative management without any surgical intervention for chyle leak and infection (3.1%) were considered as minor complications. Ten (14.2%) patients had more than one complication. Chyle leak was seen in 3.1% of patients. None patient required cervical exploration for surgical ligation of thoracic duct all were managed conservatively. One patient had a minor infection around the suture line that was managed conservatively.

DISCUSSION

Thyroid surgery is precise due to the presence of crucial anatomic structures, namely, the RLN and the parathyroid glands. The damage to these structures during surgery can lead to dreadful long-term consequences that cannot be justified taking into consideration the indolent nature of disease. The surgeon has to strike a delicate balance between the adequacy of the surgery vis-a-vis over treatment.

The present study had only 30% patients presented with tumor size localized disease, 52% with loco regional and 10.4% had distant metastasis at presentation. Various studies have documented about 1%–7% patients presenting with distant metastasis at the time of initial diagnosis.[3],[4]

Age is an important prognostic factor in thyroid cancer so much so that it is factored into the staging system. Age >45 years is known for recurrences and mortality.[5] About 35% of our patients were over 45 years of age.

Thyroid cancers have the potential to invade the strap muscles, RLN, trachea, esophagus, great vessels, larynx and prevertebral space in that order of frequency. In spite of local invasion, surgery remains the mainstay of treatment to achieve an R0 resection status even if this means sacrificing surrounding structures. Mayo clinic data reported about 6.1% RLN infiltration.[6] The present study had similar rates (6.3%). Price et al.[7] have reported poorer outcomes with locally invasive thyroid cancer. Extended total thyroidectomy patients had more complications and more events in our study, which is also well

documented in literature.[7],[8]

ETE is a poor prognostic factor.[19] It has a higher rate of nodal metastases. Residual disease is more common with ETE. In our study, it was a significant factor for overall complications and hypocalcemia. Aggressive histologies connote poor outcomes.[10],[11] The EFS for this group was significantly low.

In our study, there was no 7-day mortality emphasizing the safe nature of this specialized surgery in the present era.

Revision surgery poses a challenge because of the scarring and nonavailability of usual anatomical landmarks for parathyroid gland identification.[12],[13] In our study, about one-third were revision cases. The revision surgery in our series did not correlate with higher complication rates.

The hypocalcaemia rates depend on various factors and reporting methods.[14] Transient hypocalcaemia rates have been reported up to 46% in the literature.[14] Our study had a hypocalcaemia rate of 74.2%. The factors identified for hypocalcaemia in various studies are malignancy, unintentional parathyroidectomy[15],[16] and devascularization of parathyroid glands.[17] The risk increases with the extent of thyroidectomy[7] and reoperative procedures.[12],[13] In addition, central compartment neck dissection increases the risk of hypocalcaemia[18],[19],[20] which concurs with the findings of the present study.

Thomusch et al.[21] reported that the presence of two functioning parathyroid glands is essential to avoid hypocalcaemia. Implanted glands have more predictable survival than leaving devascularized gland in the paratracheal area.[22],[23] Careful examination of specimen is crucial to identify a parathyroid gland that has been inadvertently removed.

Although devascularized glands are autotransplanted, they take time to regain function.[25] Various studies have shown that the rate of inadvertent parathyroidectomy during thyroid surgery is between 5.2% and 21.6%.[20],[21],[22],[23] In our study, there was a significant correlation of inadvertent parathyroidectomy and aggressive histology ($p = 0.016$) with subsequent hypocalcaemia ($p = 0.007$) on multivariate analysis. The presence of ETE was a significant factor with inadvertent parathyroidectomy ($p = 0.006$). A number of studies have shown the effectiveness of the use of parathyroid hormone to evaluate the function of the parathyroid gland and selective use of oral calcium and vitamin D after thyroidectomy before clinical manifestation.[17],[24],[25],[26] However, Proye et al.[27] argued against the utility of vitamin D in thyroid surgery. We treat our patients by the reactive approach, i.e., only symptomatic patients are treated with calcium and vitamin D supplement.

We have reported our results of morbidity of central compartment clearance with respect to lesser versus complete clearance during the same study period. The rate of hypocalcaemia was 40.2% in bilateral and 17.4% in lesser clearance group.[28]

Various studies have reported vocal cord palsy rates of 2%–15%.[29],[30],[31],[32] Vocal cord palsy is under-reported in the literature because many do not document the palsy in asymptomatic patients with undetected injury of RLN.[29] The knowledge of anatomy and surgical maneuvers are important factors for RLN preservation.[30] The role of RLN monitoring has been variably reported in the literature.[29],[30],[31],[32] Bilateral thyroidectomy, malignancy, extended total thyroidectomy, revision surgery, exploration for hemorrhage; significant central compartment lymph nodal resection and lack of RLN identification[31],[32],[33],[34] are a few known factors for vocal cord palsy in the literature. In this study, we found extended total thyroidectomy as a significant factor on multivariate analysis for vocal cord palsy ($p = 0.052$). These were patients with advanced tumors, who were subjected to extensive central compartment exploration. In most of the cases, although nerve was anatomically saved, it was handled extensively for disease clearance. The use of intraoperative nerve monitoring may be a useful tool to preserve the RLN,[33] although this was not used during this study.

Infection following thyroid surgery is reported in <2% cases. This is attributed to a breach in sterile technique or contamination. The present study had only one patient with minor infection.[35]

Hemorrhage and hematoma formation occur in <2% of cases. Meticulous hemo stasis is key towards avoiding this complication. In our study, none patient required surgical exploration for hemorrhage.

No parathyroid assay was employed for assessment of hypoparathyroidism.

CONCLUSION

Thyroid cancer, even with advanced disease, is eminently treatable, with surgery being the mainstay of treatment. The complications of thyroid surgery and treatment can be severe for this indolent disease and minimized with meticulous dissection and attention to various details. Aggressive histology, the extent of thyroid surgery, distant metastasis and age are important factors, which should be factored in the algorithm of thyroid cancer management.

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