“Friend or Foe” of a Thyroid Surgeon?—the Tubercle of Zuckerkandl

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The anatomy in the head and neck is by and large fixed and predictable; surgery in this region amounts to cutting on a dotted line. There are, however, variations that deserve attention as there are many vital structures that are tightly packed in this region. A head and neck surgeon has to be well versed with these anatomical variations in order to perform an optimum and safe surgery.

One such anomaly, the tubercle of Zuckerkandl (TZN), is a posterolateral extension of the thyroid gland that has also been called as the posterior horn of thyroid [described for the first time by Otto Madelung in 1867 and later by Emil Zuckerkandl (1849–1910)] [1–3]. This tubercle arises from the lateral anlage [the thyroid gland develops from two anlages, and while the median anlage is larger, the lateral one is smaller].

The surgical significance of TZN is on account of its close relationship with the recurrent laryngeal nerve, Berry's ligament, parathyroid glands, and inferior thyroid artery (ITA). While performing total thyroidectomy especially for cancer, it is essential not to leave behind this tubercle as it contains thyroid tissue. The author has found this tubercle more often on the right side and invariably pointing to the intersection between the nerve and the ITA, thus serving as a sentinel and pointer to the nerve [1–3]. Regarding the relationship of TZN with the nerve, there are many variations that can be observed, but most commonly, the recurrent laryngeal nerve lies between the tubercle and the trachea [4–7]. If the tubercle is dissected cleanly and lifted up, the nerve can be seen almost every time at this constant position (Fig. 1). The superior parathyroid, which is relatively more constant in location as compared to the inferior parathyroid gland, is also seen right behind this tubercle at the intersection

Fig. 1 The TZN, the intersection of the recurrent laryngeal nerve (RLN), and inferior thyroid artery (ITA). The superior parathyroid may be seen lying close to the neurovascular intersection

Fig. 2 The RLN may lie in between the capsular branches of the ITA

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Fig. 3 The specimen showing the dual anomaly of the tubercle of Zuckerkindl and pyramidal lobe

between the artery and the nerve (Figs. 1, 2, and 3.). The essential aspect of dissection in this region is to dissect beyond the lateral limit of the tubercle and lifting it up to ensure that the nerve is not damaged, and the entire tubercle is taken with the specimen (Figs. 2 and 3).

The tubercle of Zuckerkindl is not uncommon and has been reported in more than 50 % of thyroidectomies. The author, however, has observed the incidence to be around 35 % in his series [2, 6, 7]. It has been found to be unilateral in most cases (75 %), and the author has found it more often on the right side [2, 3]. The tubercle may be classified into four grades according to its size, which may have a role in cadaveric anatomical dissection but none or limited role in the surgical approach and dissection.

As already mentioned, in most cases, the nerve lies between the tubercle and trachea; however, in rare scenarios, it may also lie on the anterior surface of the tubercle (6 %) making it more vulnerable to injury [2]. When small, the tubercle may point like an arrowhead to the point where the RLN and inferior thyroid artery cross each other.

The author, like many previous researchers, would like to highlight that this tubercle is a reliable and constant anatomical landmark pointing to the RLN and is a “friend” of the surgeon performing thyroidectomies [1–5]. However, when large and if the surgeon is inexperienced, it may increase the chances of suboptimal surgery and complications. It has therefore been recommended that an understanding of the embryology is vital, and the embryological approach to thyroid surgery is more useful than a purely anatomical one [2, 4–7].

To summarize, the tubercle of Zuckerkindl can serve as a surgeon's “friend” while dissecting and looking for the recurrent laryngeal nerve. A fine and meticulous dissection done with great care is essential in this region because of a close relationship of the tubercle with the nerve, parathyroid, and inferior thyroid artery. The understanding of this anomaly is therefore mandatory for a thyroid surgeon in order to perform a safe and optimum surgery.

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