



## A Contemporary Thinking on Thyroid Surgeries for Superior Cosmesis

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### Abstract

Thyroidectomies have been performed conventionally with Kocher's incision over several years. With the advent of newer techniques thyroid procedures have been relatively safer and lower in complication rates. Though the current light is not alone on surgical technique but the aesthetic outcomes of the procedure itself. The preponderance of female patients undergoing thyroid surgeries where cosmesis is of great importance has influenced the development of extracervical approaches. Inferior cosmesis of thyroid scar on low anterior neck has been a concern for most young female patients following a classical Kocher's incision. Hence various approaches have been explored since then to achieve good aesthetic results. Newer techniques like extracervical approaches, a variation of endoscopic thyroidectomies have been desired for improved cosmesis. Robotic thyroidectomy through transaxillary approach, post auricular and transoral routes for thyroid have evaded the scar visibility. These procedures are superior in aesthetics but often require elaborate instrumentation with extensive training in handling the same. And unavailability of the same in all centers are amongst the few disadvantages. In such instances a novel approach of first skin crease incision for thyroidectomy instead of caudad placed conventional Kocher's incision for improved aesthetics can be used. The first skin crease follows the path of resting skin tension lines and often hides in the shadow of mandible obscuring the scar visibility. This incision is superior in cosmesis compared to conventional one but also economically achieved and evades the need for extensive subcutaneous dissection through remote sites.

**Keywords:** Neck crease incision; Kocher's incision; Aesthetics in thyroidectomies

### Introduction

Relaxed Skin Tension Lines (RSTL) results from vectors within the skin that reflects the intrinsic tension within the skin. Lines of minimum tension of skin results from repeatedly bending of skin due to muscular contracture. A natural skin crease runs perpendicular to the direction of muscle pull and can be used as a guide for incision. The first neck crease incision is useful in hiding the scar in the shadow of mandible.

Approach to thyroid gland from first skin crease incision for superior cosmesis also favors the anatomical and surgical plane for its removal. Owing to its embryology thyroid gland is developed from the median anlage and two other lateral anlagen. The median anlage starts as a thickening of the endodermal epithelium and the foregut between the first and second brachial arches at the base of the tongue, which in later life constitutes the foramen caecum. The cells proliferate to form the thyroid bud and then a diverticulum, which descends and migrates from the base of tongue to lie anterior to the hyoid bone and trachea [1,2]. The thyroglossal duct between the thyroid gland and base of tongue until involution and disappearance of duct by birth. The two lateral anlagen known as ultimobranchial bodies develop from the caudal aspect of the fourth pharyngeal pouch supplemented by migratory neural crest elements and fuse with the median anlage as the thyroid gland descends in the neck. The median anlage forms the thyroid follicular cells and the lateral anlagen form the clear parafollicular cells (c-cells) [3]. Surgical significance of Zuckerkandl's tubercle which is a posterolateral extension of the thyroid with a close anatomic relationship with recurrent laryngeal nerve, the inferior thyroid artery, and the parathyroid glands.

### Discussion

The earliest account of thyroidectomy is probably that given by Roger Frugardi of Salerno in 1170. Theodor Kocher who performed thousands of thyroidectomies introduced meticulous hemostasis and strict antisepsis. Initially it was a vertical incision for thyroidectomies. With more

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operative experience, he transitioned from the vertical incision to an incision along the anterior border of the sternocleidomastoid, and finally to a low, transverse cervical incision which is centered over the isthmus of the thyroid gland which lies just caudad to cricoid cartilage [3,4]. Also popularly known as the Kocher's incision for thyroid.

Increased cosmetic concern influenced the advent of extracervical approaches. The video scopic and/or robotic thyroidectomy approaches were developed so that the incision in the neck is avoided (incisions in the axilla, chest, oral cavity, or around the ear, called "scarless" thyroidectomy have gained popularity.

The basic transaxillary approach involves creating a working space starting from axilla coursing over pectoralis muscle. The working space is extended superiorly over clavicle to encounter the strap muscles which are lifted off the gland. An additional port is created over paramedian chest wall incision into which a grasping device is inserted. The use of this approach requires awareness of potential harm to anatomic structures usually not at risk during conventional thyroid surgery [5]. Also transaxillary approach is technique sensitive and requires extensive training and experience [4,6].

Instead the usage of a small, high cervical skin crease incision can achieve cosmesis and adequate access to the gland. Most part of the incision will be resting in the high skin crease of the neck and is well hidden in the shadow of lower border of mandible, until the neck is hyper extended to see the incision line. The scar is less prominent giving superior cosmesis in comparison to low neck crease incision.

Though every approach has some relative indications and contraindications for the same. For this approach the relative indications can be for all benign hemithyroidectomies and total thyroidectomies.

Some relative contraindications can be for thyroid malignancies where extensive neck explorations with neck dissections are mandated and the volume of thyroid gland removed can be variable. The approach in such cases should be towards better functional outcome over cosmesis. And in cases of retrosternal extension of thyroid gland the extensive access and dissection is important. Single approach may not be feasible in removing the thyroid gland.

## Surgical Pathway

The surgical pathway and procedure are similar to that of a conventional thyroidectomy with modification in juxtaposition of incision. Though the principle of thyroidectomy remains the same with minimal technical modification in its approach. The patient is placed supine with hyperextension of neck to expose the surgical area. First prominent skin crease is identified and approximately 2 cm or more transverse incision can be placed. The dissection is carried out in subcutaneous plane. Identifying strap muscles in the midline followed by lateral retraction of strap muscles with long retractors. The superior pole of thyroid lobe is palpated for orientation. Dissection to be carried in the same direction following the surgical plane. First identification of superior thyroid vessels followed by their division away from the gland. This enables to mobilize the gland

anteriorly and medially. Capsular dissection carried out between thyroid capsule and branches of inferior thyroid artery. The recurrent laryngeal nerve is identified at tubercle of Zuckerkandl's and safely preserved. Then the branches of inferior thyroid artery are ligated individually and directly on the surface of the gland to minimize the damage to both parathyroid gland and recurrent laryngeal nerve [7,8]. The thyroid gland is elevated and retrieved. And hemostasis is achieved. Suction drain can be placed. Layered closure should be done for better approximation. Postoperative precautions remain the same. Wound to be evaluated for optimal healing and suture removal.

With periodic follow up after 3 months the surgical outcome can be reevaluated for its aesthetic appearance.

## Conclusion

Many techniques have been the cornerstone of safe and effective thyroid surgery. The dissection is based on sound knowledge of three-dimensional anatomy and landmarks with possible variations. Advent of endoscopic transaxillary approach for thyroid surgeries removes the incision from neck to the chest, breast, axilla or postauricular areas but it is not truly invasive surgery as it requires elaborate surgical dissection from a remote site was in order to achieve visible scarless thyroid removal. Though it is a highly technique sensitive and elaborate use of instrumentation. The key to the success of these approaches is a rigorous selection of patients. This simple novel technique gives ease of operation with relatively lesser complications and can be carried out in any set up. The scar is well hidden under the shadow of mandible giving superior cosmesis and aesthetics comparatively to a conventional technique. Rigorous training and endoscopic instrumentation are not required. Aesthetics are superior in comparison to the conventional technique as the position of scar is obscured anatomically.

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