



# Initial Experience of Endoscopic & Robotic Thyroid Surgery in India

**Gyan C\*, Prathyusha G, Madhu K and Nitish KG**

Department of Endocrine Surgery, Sanjay Gandhi Post Graduate Institute University of Medical Sciences, India

**\*Corresponding author:** Gyan Chand, Department of Endocrine Surgery, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow, India, Email: drgyanchandpgi@gmail.com

## Case Report

Volume 7 Issue 1

Received Date: March 31, 2023

Published Date: May 05, 2023

DOI: 10.23880/oaje-16000182

## Abstract

The First case of endoscopic thyroid surgery and scar less thyroid surgery was reported in India in 2007 and 2015. The first robotic thyroid surgery was reported in India in 2017. The various approaches has been practice in India including the trans-axillary approach, bilateral Breast and axillary approach, trans-vestibular approach and posterior auricular approach. The most popular approach is trans-axillary approach in India. The Indian doctor do not pioneer in remote access approaches for thyroid surgery however the popularities and acceptance of endoscopic and robotic thyroid surgery have been increasing in India. Majorities of publications showed that the remote access thyroid surgery is safe and effective procedure, have long learning curve that can be overcome by training with excellent cosmetic outcome.

**Keywords:** Endoscopic Thyroid Surgery; Robotic Thyroid Surgery; Thyroid; Surgery; Remote Access Thyroid Surgery

**Abbreviations:** MIVAT: Mini-Invasive Video-Assisted Thyroidectomy;

## Introduction

The conventional open safe thyroid surgery by capsular dissection has been initiated and popularized by Theodor Kocher [1]. In 1910- Charles Mayo learn this technique and popularize in USA and also known as Father of American Thyroid Surgery. Gagner M performed first endoscopic procedure in the neck in 1996 [2], similarly Miccoli P introduced mini-invasive video-assisted thyroidectomy (MIVAT) [3] and Kazuo Shimizu reported the first remote access thyroidectomy [4] and Robotic Thyroid Surgery was introduced by Chung WY [5]. There are several remote access thyroid surgery has been practiced worldwide however it

more popular in Asia continent.

The remote access thyroid surgery approaches become slowly popular in India and continue developed in selected centres. The first case of endoscopic thyroid surgery via chest wall approach was reported by Putambekar SP, et al. [6] and trans oral endoscopic thyroid surgery by Pai VM, et al. [7] and robot-assisted thyroidectomy using a gasless trans axillary approach was reported by Somasekhar SP, et al. [8]. Resurge of popularity of remote access thyroid surgery has occurred in last few years and several other endoscopic and robotic assisted thyroid surgery approaches has been applied to treat thyroid disorders by the different surgeons in different part of India including retro auricular approach, axillary and breast approach, axillary and chest wall approach and bilateral axillary and breast approach etc.

In this focused review and commentary our aim to explore the different remote access approaches which are being practiced currently in India and rationale behind it. That includes trans axillary, bilateral axillary and breast approach, retro auricular facelift approach and trans oral thyroidectomy via vestibular approach and also commentary upon best practice and future directions.

### The Chest wall Approach

This approach has been introduced by Kim, et al. [9] by performing the gasless technique. It was modified by several surgeon and using the CO<sub>2</sub> insufflation. The first case series of endoscopic thyroid surgery via chest wall approach in India was reported by Putambekar SP, et al. [6]. He used three ports over the chest wall, first 10mm trocar over the sternum and two 5mm trocar below the clavicle on both side of the sternum. He published his experience of endoscopic thyroid surgery in 15 patients, mean age was 45 years in males and 43 years in females. The female to male ratio was 2:1. He selected the tumour <6cm in size and operated both benign and malignant cases, the mean operative time was 85 minutes and none of the patient converted to open thyroid surgery. No RLN palsy and no haemorrhage, no other complications. All patients were discharged on second post-operative day with excellent cosmetic outcome in long term follow-ups. After him Bhargava, et al. published the technique of this approach [10]. He described the hybrid technique of axillary and chest wall approach. None of the other publication was found in the literature published by Indian author.

### The Axillary Approach

The technique of Axillary and breast approach was published by Chand G, et al. [11]. He described three ports used in this technique, two ports in the axilla (one 10mm & another 5mm) and one 10mm port in the ipsilateral breast through peri areolar incision. Dissect the thyroid by using energy device and take it out specimen through endobag from axillary port. Identify and preserve the RLN and parathyroid. Drain may be placed and discharge early. Bhargav, et al. [12] has published their experience of 15 cases through single incision gasless trans axillary thyroid surgery from southern part of India. They excluded the patients who have Grave's disease, tumour diameter >6cm, recurrent goitre. The mean operative time was 123 mins. There was no significant morbidity in their series. Aggarwal V, et al. [13] has published his experience of 12 cases of endoscopic thyroid surgery via axillary and breast approach. All were female, mean age was 27.2 years and tumour size was <4cm. Mean operative time was 187 minutes. There were temporary RLN palsy in one case, local wound infection in two cases prolong subcutaneous emphysema in five cases and prolong analgesic requirement (>5 days) in 10 cases. The cosmetic outcome was excellent (Table 1). Other surgeons also published their anecdotal reports on this approach. Chand G, et al. [14] published their experience of 27 patients through this approach for both hemi and total thyroidectomy. The mean operative time was 148 min for hemi thyroidectomy and 270 min for the total thyroidectomy. No significant complication with excellent cosmetic outcome.

S.N.	Year	Author	City	Approach	No of Cases	Type of Publication	Journal
1	2007	Shailesh P Puntambekar, 6	Pune	Chest wall	15	Original Article	JMAS
2	2012	Sanoop K. Zachariah, 24	Cochin	MIVAT	1	Case Report	Journal of Surgical Technique and Case Report
3	2013	Gyan Chand, 11	Lucknow	ABA	NA	Technique	WJOES
4	2013	P. R. K. Bhargav, 12	Hyderabad	Chest wall	NA	Technique	IJOS
5	2015	P S Pai, 7	TMH, Mumbai	TOETVA	NA	Case Report	International Journal of Surgery Case Reports
6	2016	Gyan Chand, 19	Lucknow	TOETVA	NA	Technique	WJOES
7	2016	P. K. Anandan	Bangaluru	TOETVA	8	Original	ACR J S
8	2017	Vivek Agarwal	New Delhi	ABA	12	Original Article	Endocrinology
9	2017	Vivek Agarwal	New Delhi	New TOA	1	Case Report	Thyroid Res & Practice

10	2017	DipankarSaha, 25	Kolkata	TOETVA	66	Review	Open Access J Surgery
11	2018	T Sivakumar, 20	Kanyakumari Tamilnadu	TOETVA	11	Original Article	JMAS
12	2019	Gyan Chand,15	Lucknow	BABA	100	Original Article	IJOS
13	2019	R. Padmakumar	Kochi	ABA	NA	News	
14	2019	Raghav Mehta1	Jaipur	TOETVA	6	Original	IJOHNS
15	2020	Srinivasan	Kochi	ABA	85	Original	International Surgery Journal

**Table 1:** Endoscopic surgery in India.

### The Bilateral Axillary and Breast Approach (BABA)

The first case series of more than 100 cases operated endoscopically of which 55 cases were through bilateral axillary and breast approach was published by Chand G, et al. [15]. They published their experience of 106 endoscopic procedures via three approaches including 55 procedures through BABA. They selected <6cm thyroid nodule managed with hemi or total thyroidectomy. The mean age was 34.7±11.4 years, M: F ratio was 1:4, mean tumour size was 5.9±1.6cm and the mean operative time was 166.58±41.95

min for hemi thyroidectomy and 241±57.92 min was for total thyroidectomy. Both benign and malignant cases were operated through this approach. The complications includes temporary hyperparathyroidism, temporary recurrent laryngeal nerve palsy bruising, paraesthesia over the chest wall was present in acceptable range. The cosmetic outcome was excellent (Table 2). Other publications by same group has shown this approach is feasible, safe and good cosmetic outcome in large goitres too [16] and results are comparable to open surgeries [17]. Chand G, et al. also published their training experience of BABA robotic thyroid surgery [18].

S.N.	Year	Author	City	Approach	No of Cases	Type of Publication	Journal
1	2017	SpSomashekhhar	Bangalore	Axilla	35	Original	JMAS
2	2017	KrishnakumarThankappan	Cochin	Post Auricular	29	Original	Gland Surgery
3	2017	SurenderDabas	New Delhi	Axilla	16	Original	IJSO
4	2018	Ashok Kr. Gupta	Chandigarh	Axilla	7	Original	IJOHNS
5	2018	KrishnakumarThankappan	Cochin	Post Auricular		Review	IJSO
6	2019	KrishnakumarThankappan	Cochin	Post Auricular	NA	Technique	JHNPS
7	2019	Sandeep Nayak	Bangalore	Axilla	1	Case Report	NEWS
8	2019	JagdishwarGoud	Hyderabad	Axilla	1	Case Report	NEWS
9	2020	Yasoda Hospital	Secundrabad	Trans Oral	1	Case Report	NEWS
10	2020	Gyan Chand	Lucknow	BABA	50	Original	JMAS

**Table 2:** Robotic Surgery in India.

### The Retro Auricular Approach

The first experience of six cases of retro auricular robotic thyroid surgery was published by Thankappan K, et al. [19]. The mean size of nodule was 2.13 cm (range from 1.5 to 3.0 cm), mean age was 38.3 years. The total thyroidectomy was performed via bilateral retro auricular approach in which each lobe was approached separately by ipsilateral retro

auricular approach. The mean operating time was 378 min and average hospital stay was 6 days (range 5 to 8 days), the majority had papillary thyroid carcinoma and three develops temporary hypocalcaemia and one patient develops hypertrophic scar. No evidence of recurrent laryngeal nerve injury and overall outcome was excellent. No other author has published their work on retro auricular approach.

## The Trans Oral Approach

The first case of transoral thyroid surgery via vestibular approach has been reported by Pai VM, et al. [7] they removed 3x4cm colloid thyroid nodule from left lobe of thyroid in 21 year old female. They found this approach is technically feasible and safe with excellent cosmetic outcome. The technique of transoral thyroidectomy via vestibular approach was popularised by Chand G in India. He published his technique [20]. He described three ports used in this technique, one 10mm ventral port in the vestibular surface of lower lip and two 5mm port on the both side of the central port at the level of canine teeth in vestibular surface of lower lip. Create subplatysmal space and dissect the thyroid by using energy device and take it out specimen through endobag from vestibular incision. Identify and preserve the RLN and parathyroid. This is shortest route, central approach to the thyroid with minimal dissection therefore drain is usually not required. Similarly, experience of 11 cases was reported by Sivakumar T, et al. [21]. His mean operative time was 126.27 min (range 170 to 90 min), the average blood loss was 2 to 3 ml and the mean thyroid volume was 23cc (range 15 to 35cc). No complication was noted in this study without visible scar in the neck. The maximum hospital stay was 4 days. They concluded that TOETVA is safe and effective surgical management of multinodular goitre and offered alternative to conventional open thyroid surgery. Recently author has published series of 42 patients who underwent transoral thyroid surgery using 3 D endoscopy [22]. There are few other studies have been published recently with similar outcomes. The robotic transoral thyroid surgery also been started in one centre recently.

Other approaches: other approaches like infraclavicular has been described in literature but are not widely used [23]. Infraclavicular approach has demerit of visible scar but large size tumours can be removed.

## Conclusion

The current state of endoscopic thyroid surgery in India presented in this report showed that the popularity of remote access thyroid surgery is being increasing rapidly with decrease in operation time, and complications. Recently new remote access procedures such as robotic assisted thyroid surgery has been rapidly adopted by Indian surgeons and hope in near future it will increase and also adopt some other advance technology such as fluorescence navigation thyroid and parathyroid surgery [24].

## References

- Giddings AEB (1998) The history of thyroidectomy. *J R Soc Med* 91(Suppl 33): 3-6.

- Gagner M (1996) Endoscopic subtotal parathyroidectomy in patients with primary hyperparathyroidism *Br J Surg* 83(6): 875.
- Miccoli P, Materazzi G (2004) Minimally invasive, video-assisted thyroidectomy (MIVAT). *Surg Clin North Am* 84(3): 735-741.
- Shimizu K, Akira S, Tanaka S (1998) Video-assisted neck surgery: endoscopic resection of benign thyroid tumors aiming at scarless surgery on the neck. *J Surg Oncol* 69: 178-180.
- Chung WY (2011) The evolution of robotic thyroidectomy: from inception to neck dissection. *J Robot Surg* 5(1): 17-23.
- Puntambekar SP, Palep RJ, Patil AM, Rayate NV, Joshi SN, et al. (2007) Endoscopic thyroidectomy: Our technique. *J Minim Access Surg* 3(3): 91-97.
- Pai VM, Muthukumar P, Prathap A, Leo JAR (2015) Transoral endoscopic thyroidectomy: A case report. *Int J Surg Case Rep* 12: 99-101.
- Somashekhar SP, Ashwin KR (2017) Robot-assisted thyroidectomy using a gasless, transaxillary approach for the management of thyroid lesions: Indian experience. *J Minim Access Surg* 13(4): 280-285.
- Kim JS, Kim KH, Ahn CH, Jeon HM, Kom EG, et al. (2001) A clinical analysis of gasless endoscopic thyroidectomy. *Surg Laprosc Percutan Tech* 11: 268-272.
- Bhargav PR, Amar V (2013) Operative technique of endoscopic thyroidectomy: a narration of general principles. *Indian J Surg* 75(3): 216-219.
- Chand G, Agarwal A (2013) Endoscopic Thyroid Surgery- How I do it? *World J Endocrine Surg* 5(3): 85-88.
- Bhargav PR, Kumbhar US, Satyam G, Gayathri KB (2013) Gasless single incision trans-axillary thyroidectomy: The feasibility and safety of a hypo-morbid endoscopic thyroidectomy technique. *J Minim Access Surg* 9(3): 116-121.
- Aggarwal V, Raja BK, Garg M, Khandelwal D, Agarwal B (2017) Endoscopic Thyroidectomy- Preliminary Experience from a tertiary care centre in Delhi, India. *US Endocrinology* 13(1): 27-29.
- Chand G, Mishra SK, Kumar A, Vimal S (2017) Endoscopic Thyroidectomy: Experience of Breast and Axillary Approach. *J Univer Surg* 5(3): 18.
- Chand G, Johri G, Mishra A, Mishra SK (2019) Endoscopic

thyroid surgery: initial experience of more than 100 cases from a tertiary care centre in India. *Indian Journal of Surgery* 81(6): 531-536.

16. Johri G, Chand G, Gupta N, Sonthineni C, Mishra A, et al. (2018) Feasibility of Endoscopic Thyroidectomy via Axilla and Breast Approaches for Larger Goiters: Widening the Horizons. *J Thyroid Res* pp: 4057542.
17. Gupta N, Chand G, Mishra A, Agarwal G, Agarwal A, et al. (2021) A Comparative Study of Clinicopathological Profile and Surgical Outcomes of Endoscopic (Bilateral Axillo-Breast Approach) Versus Conventional Total Thyroidectomy for Thyroid Tumors. *Indian Journal of Surgery* 83(1): 194-200.
18. Chand G, Yi JW, Johri G (2021) Robotic thyroid surgery using bilateral axillo-breast approach: From a trainees' point of view. *J Minim Access Surg* 17(2): 230-235.
19. Thankappan K, Dabas S, Deshpande M (2017) Robotic retroauricular thyroidectomy: initial experience from India. *Gland Surg* 6(3): 267-271.
20. Chand G, Mishra SK (2016) Transoral Endoscopic Thyroid Surgery through Vestibular Approach: How I do it? *WJES* 8(2): 10.5005.
21. Sivakumar T, Amizhthu RA (2018) Transoral endoscopic total thyroidectomy vestibular approach: A case series and literature review. *J Minim Access Surg* 14(2): 118-123.
22. Chand G, Gupta N, Johri G, Moidu S, Mishra A, et al. (2021) Natural Orifice Endoscopic Thyroidectomy via Transoral Vestibular Approach (TOVA): Single Surgeon Experience from North India. *Indian Journal of Otolaryngology and Head & Neck Surgery* 73(2): 160-166.
23. Zachariah SK (2012) Gas-less Video-assisted Thyroidectomy for a Solitary Thyroid Nodule: Technical Report of the First Case Performed at a Rural Teaching Hospital in India and Review of Literature. *J Surg Tech Case Rep* 4(1): 27-31.
24. Dipankar S (2017) Review Article on Transoral Endoscopic Thyroid Surgery. *Open Access J Surg* 2(3): 555590.

