

OBSERVATION ON PRESENCE OF MIDDLE THYROID VEIN DURING THYROID SURGERY

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ABSTRACT

BACKGROUND:

Thyroidectomy is a very common operation nowadays. The indications for surgery are uncertainty about the nature of a thyroid mass, or treatment of a large Goitre causing compressive symptoms, thyroid cancer, or Thyrotoxicosis refractory to medical management.⁴

Middle thyroid vein is short & stout and also is a fragile structure unsupported by any artery unlike superior and inferior pedicle. Chevrel et al.⁵ report its presence in 29%, while for Shima et al. the frequency is 55.2%. The diameter is 2 ± 0.8 mm and length is 46.1 ± 18.6 mm

AIM OF THE STUDY:

1. To study incidence on presence of middle thyroid vein in patients undergoing total or near total thyroidectomy, in MKCG Medical College and Hospital.
2. To study the dimension and other anatomical variation of Middle thyroid vein in patients undergoing total or near total thyroidectomy.
3. To study any change in dimension of Middle Thyroid Vein depending on histopathologic finding.

MATERIAL AND METHODS:

Source of Data-The patient admitted to the General Surgery Department of M.K.C.G. Medical College and Hospital, Berhampur and who will undergo Total/Near Total thyroidectomy.

Methods

- Observation during Total/Near Total Thyroidectomy.
- Measurement of Length and external diameter of middle thyroid vein, carried out by placing a stainless-steel spring Divider calliper along each vascular section and comparing the distance with calibration of a measuring scale.
 1. Length: The horizontal distance from its origin at outer capsule of thyroid to its termination.
 2. Breadth: A segment of vessel cut, open it lengthwise, measure its circumference, and finally, external diameter calculated from it.
- Position of vessel carried out by a Divider calliper & measuring scale, using following reference
 1. The vertical distance between the termination of middle thyroid vein and the transverse plane passing the upper margin of hyoid bone

The horizontal distance between the sagittal plane passing the termination of Middle thyroid vein and its intersection with the mid-sagittal line.

All the reports were collected and analysed using software package for statistical analysis (SSPS 20).

STUDY DESIGN

Prospective Study

RESULTS;

Out of 72 cases of various thyroid surgery were taken into study during the period from August 2019 to July 2021 M.K.C.G Medical College and Hospital , Berhampur is a tertiary level hospital catering mostly to the population of South Odisha. MTV was found in 19.44% cases , out of which 16.6% of cases was found in left lobe and rest in the right lobe and more frequently in cases with hyperthyroidism that is around 50% and rest in patients with goiter(30.7%).

CONCLUSION;

Incidence of middle thyroid vein ,together with its identification in particular category of cases may be helpful to prevent risk of intraoperative and postoperative bleeding during surgeries.

Keywords;

MTV- middle thyroid vein,

INTRODUCTION:

Knowledge of the anatomy of the veins in the anterolateral cervical region, particularly the Thyroid veins, is important because of its application in Thyroid¹, Parathyroid and Laryngeal surgery, in the transposition of myocutaneous flaps for reconstructions and, particularly, in Tracheostomies. The frequency of indications for Thyroidectomy is increasing nowadays and thus the occurrence of haemorrhagic events is increasing likewise. Krausen found the pattern given in treatises for the anatomy of the Thyroid veins in only three out of ten dissections, and reports confirm the surgical accidents caused by variations.²

The earliest account of Thyroidectomy is probably that given by Roger Frugardi of Salerno in 1170.³

The morbidity and mortality, usually from uncontrolled bleeding and sepsis, were prohibitive but advances in general anaesthesia, antisepsis and haemostasis paved the way for surgeons at the turn of the century to make Thyroidectomy a safe and acceptable operation. At the forefront of these developments was Theodor Kocher of Berne who performed thousands of Thyroidectomies bringing the mortality down to under 1%. Today, Thyroidectomy should be an extremely safe and uneventful procedure when performed by a trained endocrine surgeon.⁴

Thyroidectomy is a very common operation nowadays. The most frequent indications for surgery are uncertainty about the nature of a thyroid mass, or treatment of a large Goitre causing compressive symptoms, thyroid cancer, or Thyrotoxicosis refractory to medical management.⁴

Middle thyroid vein is short & stout and also is a fragile structure unsupported by any artery unlike superior and inferior pedicle. Chevrel et al.⁵ report its presence in 29%, while for Shima et al. the frequency is 55.2%. The diameter is 2 ± 0.8 mm and length is 46.1 ± 18.6 mm.⁶

The middle thyroid vein, located laterally to the thyroid gland just above the inferior thyroid artery, was present in only 43.3% of the dissected sides. It was present bilaterally in 7 cases (23.3%), on the right side while absent on the left in 7 cases (23.3%) and absent on the right side while present on the left in 5 cases (16.7%). It was formed by the confluence of primary branches (88.9%) or secondary branches (11.1%). It drained the medial part of the gland (70.4%), the medial and lower parts (22.2%) or the upper, medial and lower parts (7.4%). The termination of the internal jugular vein was single and the distance in relation to the medial sagittal plane was within 3 cm in 44.4% and more than 3 cm away in 55.6%, on the right in 81.5% or associated with other veins in 18.5%⁵. Oszukowski and Kosinski found this termination in one case (1.7%) at the vertebral vein⁷.

AIMS AND OBJECTIVES

- To study incidence on presence of middle thyroid vein in patients undergoing various thyroid surgery in M.K.C.G. Medical College and Hospital, Berhampur.
- To study the dimension and other anatomical variation of Middle thyroid vein in patients undergoing various thyroid surgery.

Hence, the objective of this study will be to draw conclusion on, the presence of middle thyroid vein, in thyroid surgery, thereby contributing the significant idea about surgical anatomy & variation of the vein, which make thyroid surgery much easier and simpler.

INCLUSION CRITERIA:

- All age group
- Patient of either sex.
- Patient underwent total & near total thyroidectomy
- Subtotal thyroidectomy
- Hemi Thyroidectomy & Lobectomy

EXCLUSION CRITERIA:

- Patient underwent previous Thyroid and Parathyroid surgery
- Various Thyroiditis

STUDY DESIGN

- Prospective study

OBSERVATION:

Seventy-two cases of various thyroid surgery were taken into study during the period from August 2019 to July 2021. M.K.C.G. Medical College and Hospital, Berhampur is a tertiary level referral hospital catering mostly to the population of South Odisha. Hence this random case selection may amply represent the disease study of South Odisha.

Following observations were noted according to different parameters.

Table-1**OVERALL INCIDENCE OF MTV**

MTV	No. of Cases	Percentage
Present	14	19.44
Absent	58	80.56

The MTV was found in 14 patients, out of 72 patient, underwent various thyroid surgery.

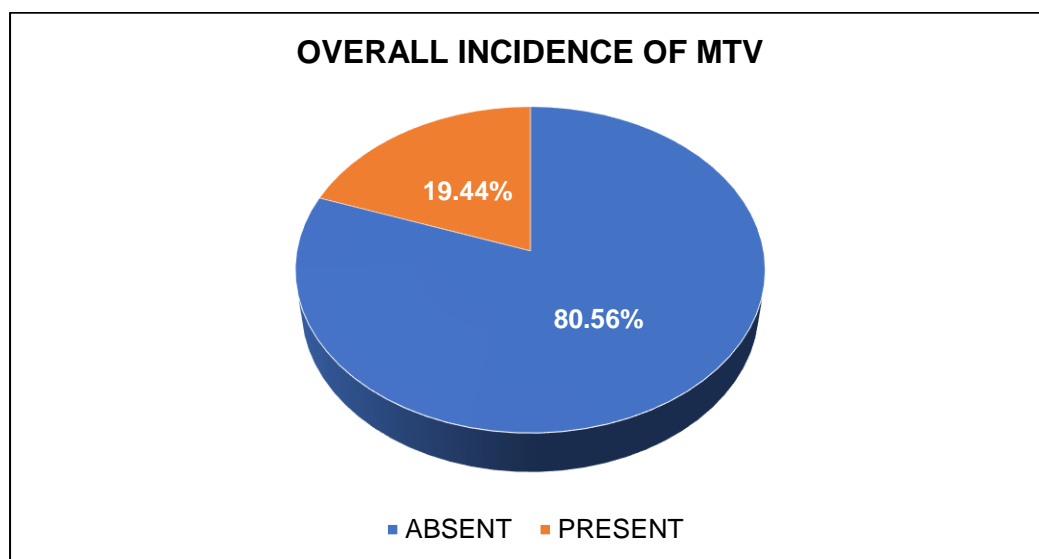


Table 2:
INCIDENCE OF MIDDLE THYROID VEIN PER EACH THYROID LOBE

Middle thyroid vein	No. of Lobes	Percentage
Present	18	14
Absent	110	86

The above table shows 18 (14%) cases middle thyroid vein was present and 110 (86%) cases it was absent.

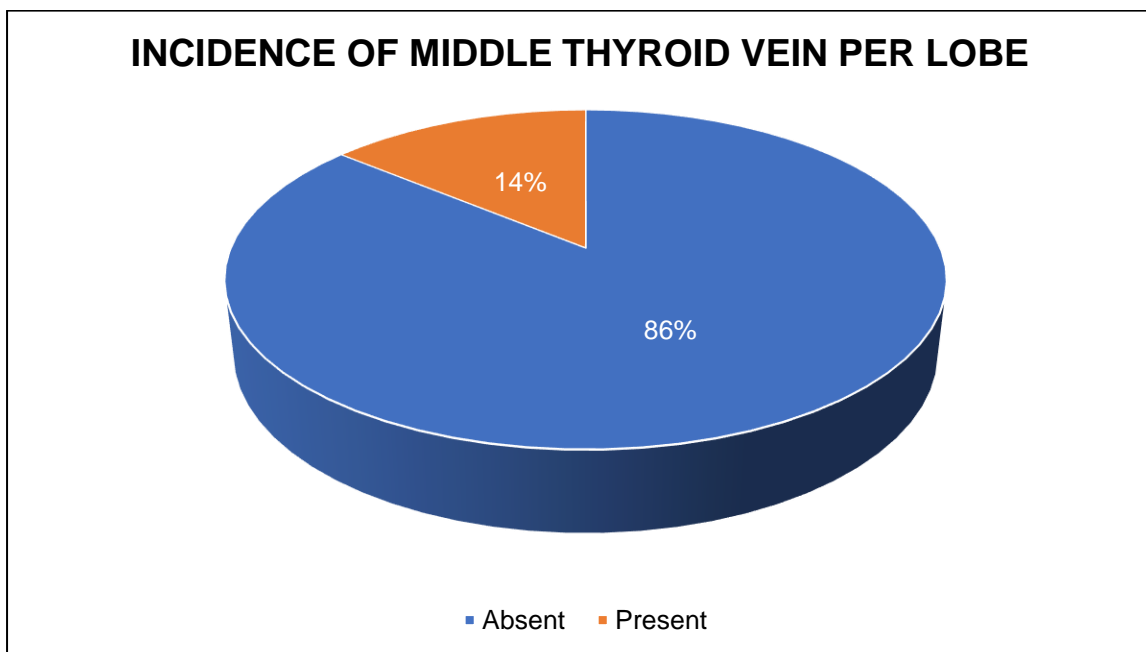
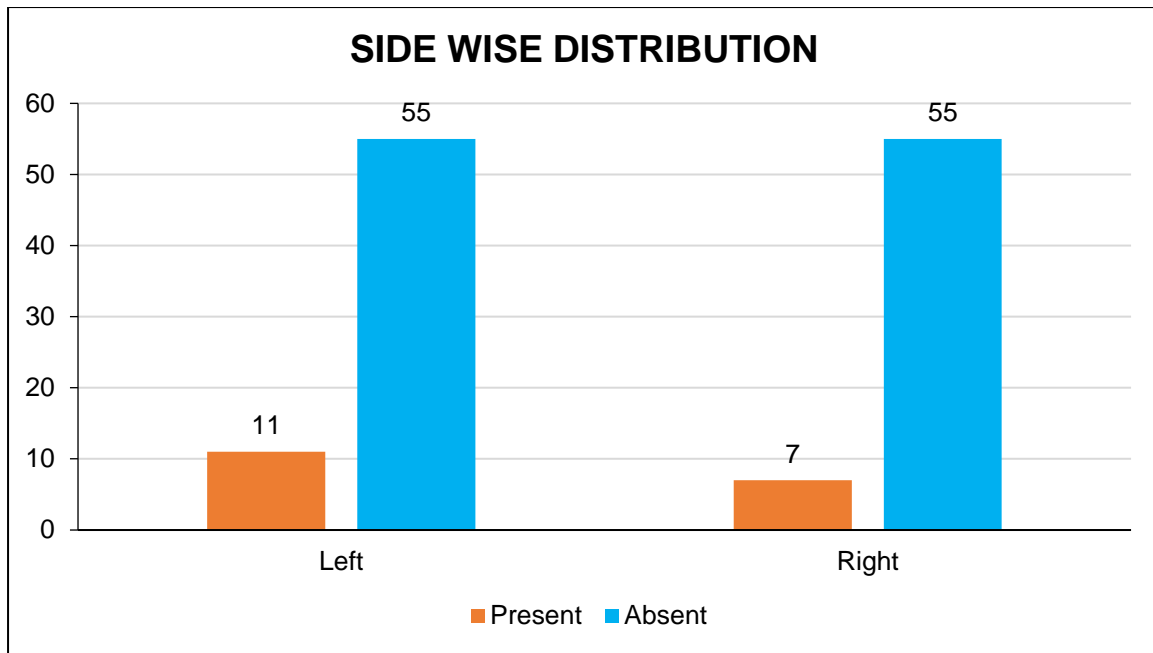


Table 3:
SIDE WISE DISTRIBUTION OF MIDDLE THYROID VEIN

Side	Present	Absent	Percentage
Left	11	55	16.6
Right	7	55	11.2



In the present scenario incidence of MTV is more in left than right. Out of 66 cases on left lobe, MTV present in 11 cases, and out of 62 cases on right lobe, MTV present in 7 cases.

Table -4:

LENGTH OF MIDDLE THYROID VEIN

Length	No. of Lobe	Percentage
< 1 cm	7	38.9
>1 cm	11	61.1

The table shows that the middle thyroid vein were varied length. Out of 18 cases, 7 cases (38.9%) were length <1cm, 11 cases (61.1%) were length >1cm.

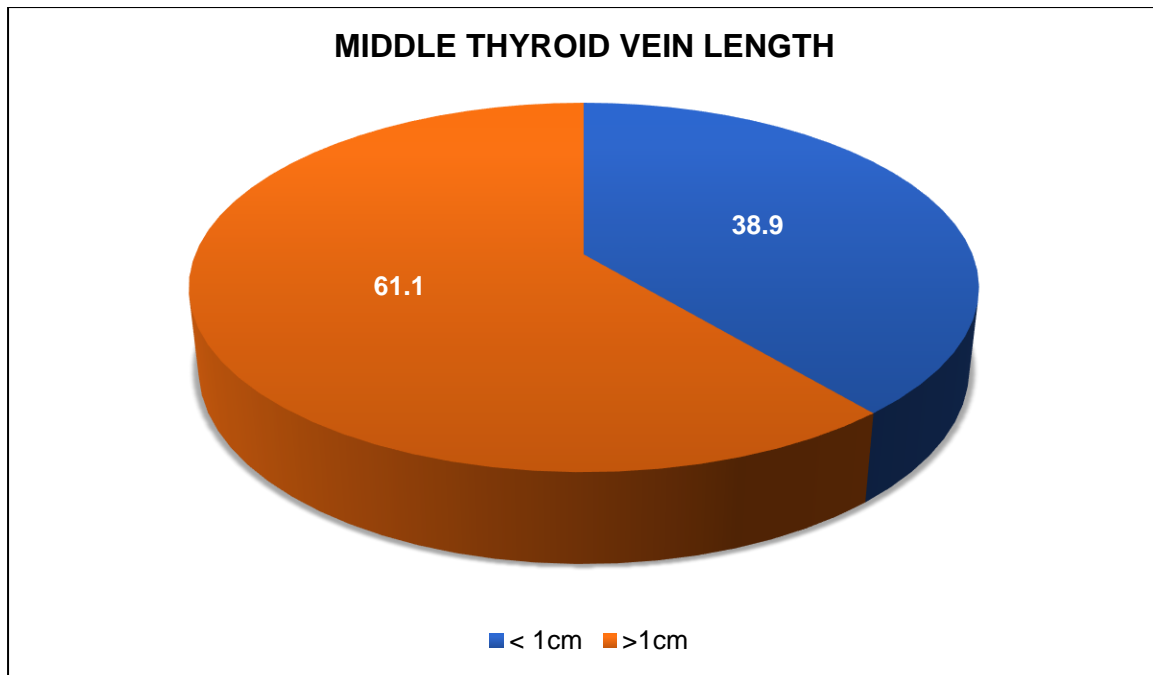


Table 5
DIAMETER OF MTV

Diameter	No. of cases	Percentage
<2mm	5	27.8
>2mm	13	72.2

The above table shows that middle thyroid vein were varied diameter. Out of 18 cases, 13 cases (72.2%) were diameter >2 mm and 5 cases (27.8%) were diameter <2mm.

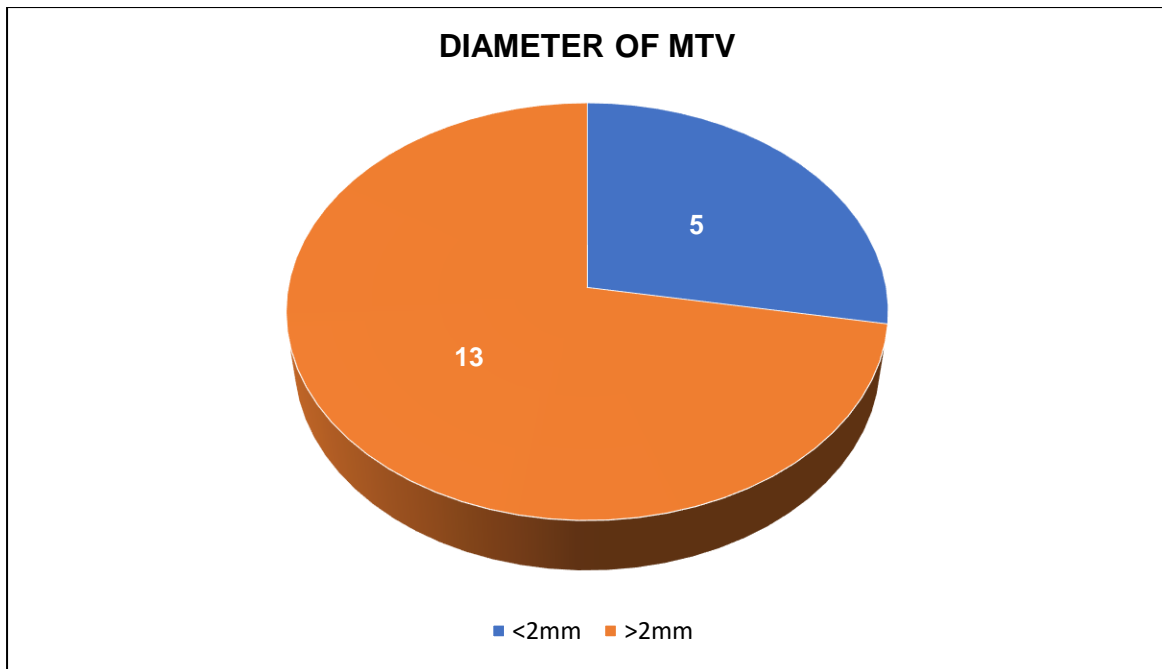
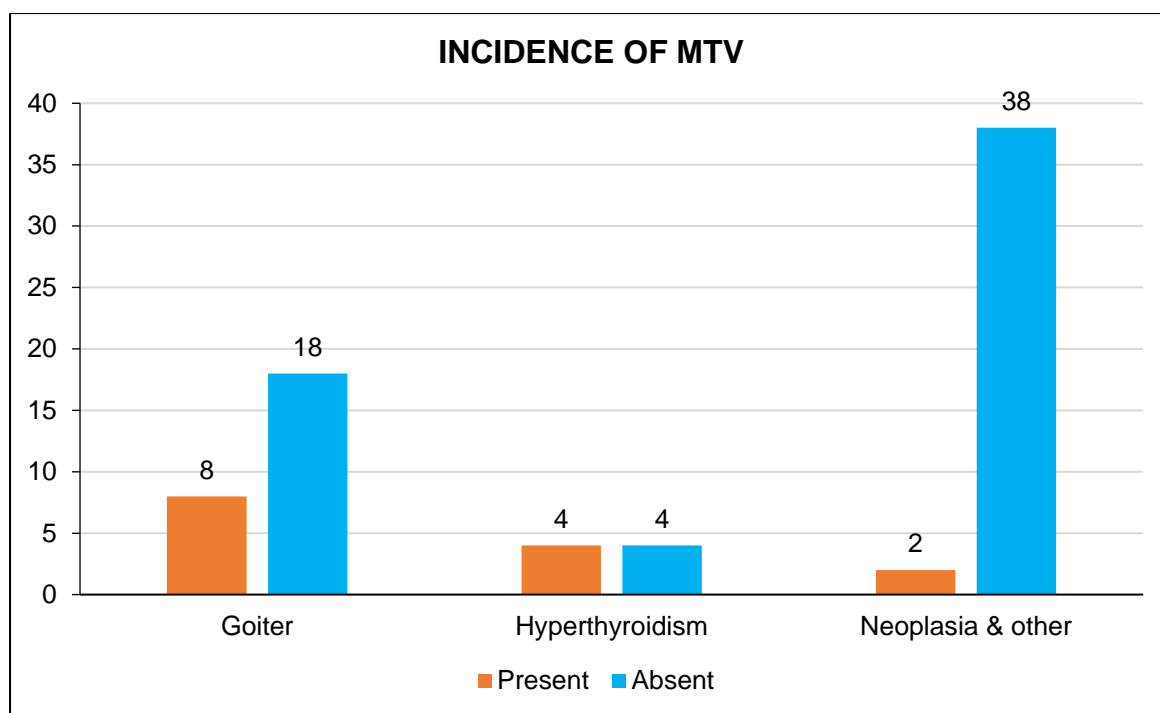


Table-6
INCIDENCE OF MTV AS PER HISTOPATHOLOGY REPORT

HP report	Present	Absent	Percentage
Goiter	8	18	30.7%
Hyperthyroidism	4	4	50%
Neoplasia & other	2	38	0.05%

The above table shows that, presence of middle thyroid vein more frequent with hyperthyroidism (50%) and goiter (30.7%).



The study comprising of 72 cases of thyroid surgery at Department of Surgery, M.K.C.G Medical College, Berhampur. After screening from outpatient department and completion of all stepwise investigations, the cases were selected for the study. Our main concern is to find incidence and surgical anatomy of MTV.

This research should be considered as a prospective, anatomical, descriptive study designed to evaluate both from a qualitative and statistical point of view the prevalence of the middle thyroid vein by presenting a number of details that have never been described before. We tried to focus on the anatomy of the MTV, which is an undoubtedly relevant issue within thyroid surgery, despite having been generally ignored in medical literature. We have investigated and analyzed the frequency, numerical variations, and anatomical geometric characteristics of the MTV in patients with thyroid disorders (total of 128 thyroid lobes), and our data are intended to support early studies that indicated the rarity of the vein. The existing topographical descriptions of MTV are the result of old anatomical researches on either a small number of patients or fresh cadaver autopsies. On the contrary, what we did was analyze MTV in vivo, with surgical dissection, in more than 128 thyroid lobes of 72 consecutive patients. The presence of MTV resulted to be significantly correlated with hyperthyroidism and large goiters, and an intriguing consideration and possible explanation for this is that MTV enlarges concomitantly with the gland or is a consequence of hyperfunction. Therefore, this finding suggests that it is even more advisable to try to positively identify MTV in these situations to prevent its injury, which may be troublesome for both intraoperative and postoperative bleeding. In addition, there was no evidence that MTV frequency is increased by the presence of thyroid malignancy. In addition, we reported a remarkable

asymmetry of MTV. By surgical dissection, MTV presence was more frequent on the left side rather than on the right. In contrast, no significant differences were found in the distribution of MTV, origin, caliber, and length between the two sides of the neck, and another finding also showed that there were no gender differences for any of the parameters analyzed.

Table-7

COMPARISON OF PRESENCE OF MIDDLE THYROID VEINS OBSERVED IN PRESENT AND PREVIOUS STUDIES

Author	Incidence per lobe(%)
Wafae et al ⁵	43.3
Shima et al ⁶	55.2
Dionigi et al ³¹	38
Present study	14.06

SUMMARY

- A prospective study of 72 cases of various thyroidectomy admitted to M.K.C.G Medical College and Hospital, Berhampur was done during the period from August 2019 to July 2021.
- The incidence of middle thyroid vein per lobe was 14%.
- In all cases MTV was originated from middle part of gland and inserted in internal jugular vein.
- In 72% cases middle thyroid vein diameter >2mm and in 67% cases its length found to be >1cm.
- It was found that middle thyroid vein presence was more frequent on the left side (16.6%) rather than on the right (11.2%)
- There was a considerably higher frequency of middle thyroid vein in hyperthyroidism (50%) and goitres (30.7%).
- In all cases MTV anteriorly crossed common carotid artery and internal jugular vein.

CONCLUSION

The description of the variable course of the middle thyroid vein, together with its categorization, may help minimize the risk of intraoperative and postoperative bleeding during surgery. In fact, unsuccessful identification or accidental dissection of middle thyroid vein can give rise to intraoperative and postoperative considerable hemorrhage. Finally, the study needs to be expanded to verify the incidence of middle thyroid vein. However, it is important to point out that it would be a mistake to conclude anything about normal middle thyroid vein anatomy, because the data arise from preselected patients who require thyroid surgery for disease. It would be interesting to correlate these data with vascular casts, venography, or cadaver dissection as well. There also is a need for studies designed to inform about the venous vascularization in lobes that do not show any presence of middle thyroid vein.

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