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Higher division of right internal thoracic artery – a case report



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ABSTRACT

The internal thoracic artery (ITA) is the largest artery of the thoracic wall. ITA has become a conduit of choice for coronary artery bypass graft surgery because of its predictable intrathoracic course, anatomical proximity to the heart and excellent long-term patency. The rare and unexpected occurrence of anomalies of the internal thoracic artery such as the one reported here may complicate the entire procedure of revascularization of the myocardium. We conclude that knowledge of variation of internal thoracic artery is necessary during surgical procedures that involve thoracic region.

Keywords:

Higher division, Internal thoracic artery, Musculophrenic artery, Superiorepigastric artery, variation

Introduction:

The internal thoracic artery (ITA) is the largest artery of the thoracic wall. ITA arises from 1st part of the subclavian artery, about 2.5 cm above and behind the medial end of clavicle. It runs downward on the inner surface of the ribcage, approximately a centimeter from the sides of the sternum, It is accompanied by the internal thoracic vein. It runs deep to the internal intercostals muscle, but superficial to the sternocostalis muscle. It runs downward until it divides into the musculophrenic artery and the superior epigastric artery in the sixth intercostal space. It usually gives pericardiophrenic, mediastinal, pericardial, sternal, anterior intercostal, perforating, and terminal branches as described in various textbooks of Anatomy [1, 2].

ITA has become a conduit of choice for coronary artery bypass graft surgery because of its predictable intrathoracic course, anatomical proximity to the heart and excellent long-term patency. Now a day's unilateral / bilateral pedicle, sequential or free graft of ITA will be used in CABG surgery because of long term patency and event free survival. Now studies have shown that skeletonised bilateral internal thoracic artery grafting can provide better event free survival than single internal thoracic artery grafting in selected group of patients [3]. In autologous breast reconstruction internal thoracic vessels are widely used as recipient vessels. Despite this, normal and pathological variations in internal thoracic artery architecture have been described. These variations have the potential to complicate dissection and the selection of suitable vessels in various surgical procedures [4]. It is the main source of blood supply to the sternum. Sternal wound complications will occur due any damage to this supply [5, 6]. Here we are presenting a rare case report of higher bifurcation of internal thoracic artery in the third intercostals space.

Case Report:

During the dissection of the anterior thoracic wall of a middle aged male cadaver for MBBS batch 2013/14 at Dr. Pinnamaneni Siddhartha Institute of Medical Sciences & Research Foundation, Gannavaram Mandal, Krishna District (A.P), (India), the following variation of the internal thoracic artery was found.

The right internal thoracic artery divided into superior epigastric artery and musculophrenic artery in the third (3rd) intercostals space. It originated from right subclavian artery as usual. Left internal thoracic artery divided into superior epigastric artery and musculophrenic artery in the sixth intercostals space as usual. Anterior intercostals arteries for 3rd to 6th intercostals spaces were arose from musculophrenic artery. Remaining branches of internal thoracic artery were of normal origin. The length of right internal thoracic artery was 9.3 cm. The length of left internal thoracic artery was 15.1 cm. These measurements were taken with the help of thread and scale. The diameter of right internal thoracic artery was 1.8 cm. The diameter of left

internal thoracic artery was 1.9 cm. These measurements were taken with the small spreading caliper and scale.

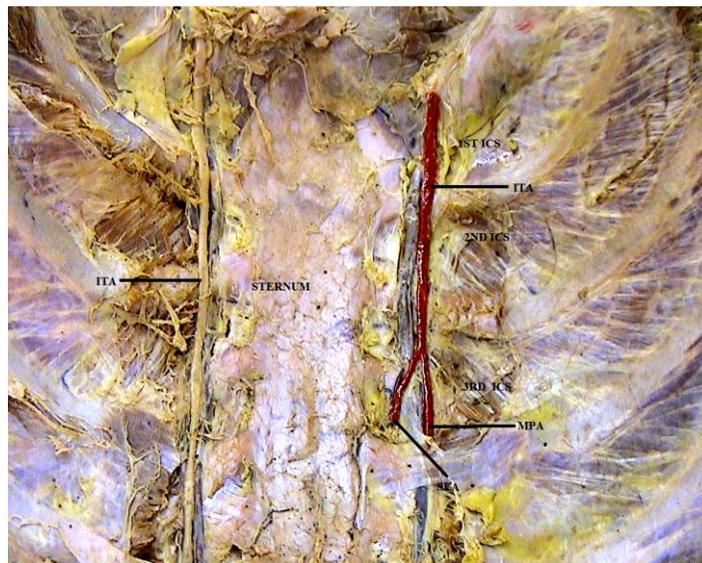


Figure 1 - Dissection of anterior thoracic wall showing the higher bifurcation of right internal thoracic artery.

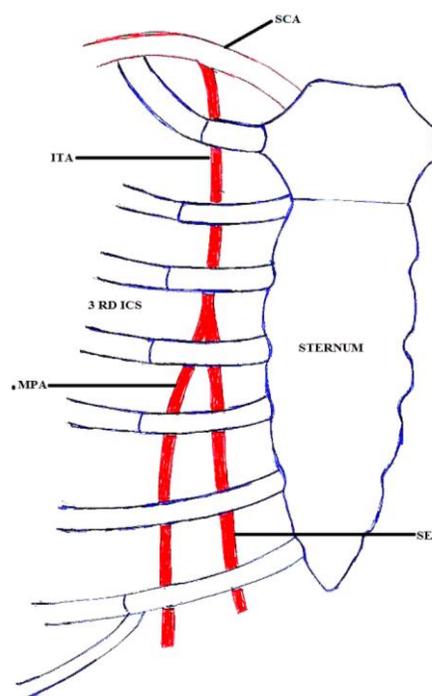


Figure 2 - Schematic diagram showing the higher bifurcation of right internal thoracic artery.

ITA - Internal thoracic artery, MPA - Musculophrenic artery, SEA - Superior epigastric artery SCA - Subclavian artery, ICS - Intercostal space

Discussion

The present case reports a rare variant of the higher bifurcation of internal thoracic artery in the third intercostal space. Such higher bifurcation of internal thoracic artery was found to be rarely reported in literature. Even Gupta *et al* reported highest bifurcation of internal thoracic artery at fifth intercostal space. Due to higher bifurcation length of right internal thoracic artery was very short i.e. 9.3 cm on right side. The diameter of right internal thoracic artery was slightly smaller than the mean diameter of Gupta *et al*. In revascularization of the myocardium, the coronary artery is surgically anastomosed with the internal thoracic artery by mobilizing the latter. The rare and unexpected occurrence of anomalies of the internal thoracic artery such as the one reported here may complicate the entire procedure of revascularization of the myocardium [7]. Internal thoracic artery has range of congenital, pathological and iatrogenic variations. These variations have the potential to limit the use of the internal thoracic artery in autologous breast reconstruction. Before surgery imaging with ultrasound or CTA may provide a clear and accurate method of identifying these anatomical variations [4]. There is need to compare prevalence of anatomical variations in it on both sides in the same individuals due to frequent bilateral use of internal thoracic artery.

Conclusion

We conclude that knowledge of variation of internal thoracic artery is necessary during surgical procedures that involve thoracic region. Same time knowledge of variation of internal thoracic artery described in present case will aware surgeons and makes them careful during surgical procedures.

Abbreviations

Intercostal space (ICS), Internal thoracic artery (ITA), Musculophrenic artery (MPA), Subclavian artery (SCA), Superior epigastric artery (SEA)

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Competing interests

Authors declare that they don't have any competing interest.

Authors' contribution

Dr. Vishal Manoharrao Salve and Dr. Rashmi Narayanrao Gitte, took part in the dissection, review of literature, writing the manuscript and revising it. Final manuscript is accepted by all authors for publication.

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References

1. Williams PL, Gray's Anatomy (The Anatomical basis of medicine & surgery), 38th ed., Edinburgh, Churchill Livingstone, 1995; 1548 & 1558.
2. Hollinshead WH. Anatomy for surgeons. (The Thorax, Abdomen and Pelvis), 2nd ed., New York, Harper & Row Publisher, 1961; 9.
3. Puri N, Gupta PK, Mahant TS, Puri D. Bilateral internal thoracic artery harvesting; Anatomical variations to be considered. IJTCVS. 2007; 192-6.
4. Murrey AC, Rozen WM, Alonso-Burgos A, Ashton MW, Garcia-Tutor E, Whitaker IS. The anatomy and variations of the internal thoracic (internal mammary) artery and implications in autologous breast reconstruction: clinical anatomical study and literature review. Surg Radiol Anat. 2012;34(2):159 -62.
5. Hazelrigg, SR, Wellons, H.A., Schneider, J.A. *et al.*: Wound complications after median sternotomy. Journal of Thoracic and Cardiovascular Surgery.1989; 98: 1096-9.
6. Gupta M, Sodhi L, Sahani D. The branching pattern of internal thoracic artery on the anterior chest wall. J Anat. Soc. India. 2002;51(2):194-8.
7. Rao KPS, Dutta S, Narayana K. A rare variant of internal thoracic (mammary) artery. Eur J. Anat. 2004;8(1):35-7.