

Case Study

Bifid Xiphoid Process- A Case Report

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Access this article on online: www.japs.co.in

Published by International Academy of Ayurveda-Physicians (IAAP), 7HB, Gandhinagar, Jamangar-361 002

Date of submission: 14-05-2018; Date of Revision: 21-06-2018; Date of Acceptance: 12-07-2018

Abstract:

The sternum is a flat bone forming the anterior median part of the thoracic skeleton. Xiphoid process is the smallest part of the sternum. It is at first cartilaginous, but in adult it becomes ossified near its upper end. It varies greatly in its morphology and lies in the floor of epigastric fossa.

A bifid xiphoid process was observed during routine cadaveric dissection of the pectoral region, which was seen as an everted bulging mass in the epigastric pit between the two costal margins. There is a need for awareness of these findings as they may determine the accuracy of clinical and other procedures in thoracic region.

Keywords: Bifid xiphoid process, variation, sternum

Introduction

The sternum is a flat bone forming the anterior median wall of the thoracic skeleton. In shape, it resembles a short sword, made of three parts. The upper part corresponding to the handle is called the manubrium, middle part resembling the blade is called the body and the lowest tapering part forming the point of sword is the process or xiphisternum.

The xiphoid process, which is the smallest and most variable part of the sternum, is thin and elongated. It lies at the level of T₁₀ vertebra. Although often pointed, the process may be blunt, bifid, curved or deflected to one side or anteriorly. It is cartilaginous in young people but more or less ossified in adults, older than the age of 40 years. In elderly people, the xiphoid process may fuse with the sternal body.

Its junction with the sternal body at the xiphisternal joint indicates the inferior limit of the central part of the thoracic cavity projected onto the anterior body wall; this joint is also the site of the infrasternal angle (subcostal angle) of the inferior thoracic aperture.

It is a midline marker for the superior limit of liver, the central tendon of the diaphragm, and the inferior border of the heart.

Attachments : to its anterior surface are attached the most medial fibres of Rectus abdominis and aponeuroses of External and Internal obliques, to its lower end the linea alba and to its border the

aponeuroses of Internal oblique and Transversus abdominis. To its posterior aspect slips of diaphragm and origin to sternocostalis muscles are attached and it is here related to liver.

Case report:

During the routine dissection of pectoral region in Department of Rachana sharir (Anatomy) of SDM College of Ayurveda and Hospital, Hassan a bifid xiphoid process was observed in an approximately 60 year old male cadaver. The cadaver was without any deformity and well preserved. The dissection was carried out according to Cunningham's manual of practical anatomy as follows-

A vertical incision over the skin of thorax was given extending from the suprasternal notch to the tip of xiphoid process. The skin was reflected following which the muscles were exposed. The pectoralis major and pectoralis minor muscles were reflected. The complete sternum was visualized along with the xiphoid process.

Following observations were noted;

- Bifid xiphoid process was observed, which was deflected from median plane towards either sides
- The process was continuous with the sternum and the xiphisternal joint was found ossified

- It was observed to be 10degrees everted anteriorly

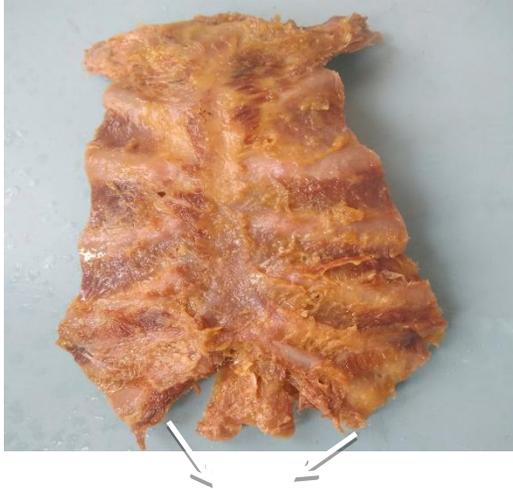


Fig 1: Bifid xiphoid process

Discussion

Somatic mesoderm(paraxial mesoderm) in the ventral body wall gives rise to the sternum and the stages of formation of sternum are;

- Sternal bars or plates develop on either sides of the midline during 6th to 7th week of development
- Fusion of the sternal bars starts during 8th week at the cranial end and proceeds caudally towards body of sternum and xiphoid process by 9th week.
- Ossification of the manubrium and body of sternum occurs by separate ossification centres. The xiphoid process ossifies only late in life. The centre for xiphoid process appears during the age of three years or later. It fuses with the body at about 40 years.

variations of sternal development includes;

- Cleft sternum
- Perforated sternum
- Bifid xiphoid process

Conclusion

There are limited reports on variations of xiphoid process, but it has to be considered. The xiphoid process is variable in its morphology. It may be perforated, bifid, or deflected.

Many people in their early 40's suddenly become aware of their partly ossified xiphoid process and consult their physician about the hard lump in the pit of their stomach(epigastric fossa). Never having been aware of their xiphoid process before they fear

they have developed a tumour such as stomach cancer.

Hence a thorough knowledge of the embryology and anatomy of the xiphoid process is important in clinical and surgical practice to make differential diagnosis in case of a suspected mass in epigastric fossa. Since xiphoid process is a highly variable part of the sternum normal variations are to be understood to plan accordingly during various surgical interventions of thoracic region.

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Cite this article as: Manu Krishnan.K, Uma.B.Gopal, Pranav Krishnan, Santosh Kumar Singarapu, Akshata.BK, Jeevankumar giri : Bifid Xiphoid Process- A Case Report. *Journal of Ayurveda Physicians and Surgeons* October, 2018 Volume 5(4): 123-4.

Financial Assistance: Nil; Interest of conflict: not declared.