

## ACCESSORY SULCI OF LIVER IN THE POPULATION OF HARYANA

Satish Jain <sup>\*1</sup>, Indersain Gupta <sup>2</sup>, Monica Jain <sup>3</sup>, RP Singal <sup>4</sup>.

<sup>\*1</sup> Assistant Professor, Dept. of Surgery, Maharaja Agrasen Medical College, Agroha, India.

<sup>2</sup> Assistant Professor, Dept. of Orthopaedics, Maharaja Agrasen Medical College, Agroha, India.

<sup>3</sup> Professor, Dept. of Anatomy, Maharaja Agrasen Medical College, Agroha, India.

<sup>4</sup> Assistant Professor, Dept. of Radiology, Maharaja Agrasen Medical College, Agroha, India.

### ABSTRACT

**Aims and objectives:** Research on segmental anatomy of liver has been extensively done but very little work is done on Accessory Sulcus (AS).

**Participants:** Present study was carried on 36 cadaveric livers with mean age ranging between 30-60 years.

**Main outcome measures:** Although, variation in surface of liver are reported but very few studies are there which reports their presence on inferior surface, on caudate lobe, in gall bladder fossa and right lateral surface of liver.

**Result:** We found AS in 13 livers (36.1%) out of 40 livers. These Sulci were transverse, vertical as well as curved in shape. Out of these in nine liver a single sulcus was present (25%) while in five livers the sulci were multiple (13.88%).

**Conclusion:** This study highlights the occurrence of variations on the liver surface. The finding of this study may be utilized by imaging specialists & surgeons respectively to avoid errors in interpretations & subsequent misdiagnosis.

**KEY WORDS:** Sulcus, Accessory, Liver, Caudate, Gall Bladder.

**Address for Correspondence:** Dr. Satish Jain, Assistant Professor, Dept. of Surgery, Maharaja Agrasen Medical College, Agroha, India. **E-Mail:** [neetu14bansal@gmail.com](mailto:neetu14bansal@gmail.com)

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### INTRODUCTION

Liver being the largest gland of the human body has great capacity of regeneration and accounts for 2% to 3% of total body weight. So, a sound knowledge of a normal anatomy and its variation is a pre requisite for a good surgical and radiological outcome, which is of great significance in the era of minimal invasive surgical approach and diagnostic imaging. Research on segmental anatomy of liver has been extensively done but very little work is done on Accessory Sulcus (AS). These sulci have different shapes being linear, transverse or

curved various lengths and depth and single or multiple in numbers. These have been investigated as congenital, developmental or acquired due to diaphragm or costal pressure [1,2,3]. The development of AS could be due to genetic predisposition [4,5]. If there is any failure of genetic guidance especially in the younger age group, it can lead to formation of sulci [5]. Hence anatomical knowledge of AS or AF is important for surgeon & radiologist in their daily clinical practice. Thus, aim of our study is to find out the incidence of AS in cadaveric liver and to study its clinical significance in population of Haryana.

## MATERIALS AND METHODS

Present study was carried on 36 cadaveric livers while they were used for routine dissection classes for medical undergraduate students. The mean age of cadaveric ranges between 30-60 years of age. The embalmed livers were carefully studied for the presence of AS. Livers with features of cirrhosis or any damage were excluded from the study. Livers were numbered and photographed and appropriate measurements were taken with the help of callipers and measuring tape.

## RESULTS

In the present study, out of 36 livers, AS was observed in 13 livers (36.1%) . Grooves were present on inferior, antero-superior (figure 1) and right lateral surfaces. Few AS were also observed on caudate lobe and in gall bladder fossa (figure 2). These Sulci were transverse (figure 3), vertical as well as curved in shape. Out of these in nine liver a single sulcus was present (25%) while in five livers the sulci were multiple (13.88%).

**Fig. 1:** Showing deep grooves on antero-superior surface.



**Fig. 2:** Showing vertical grooves on caudate process, in gall bladder fossa.



**Fig. 3:** Showing transverse & vertical grooves on inferior surface.



**Table 1:** Showing AS present on various surfaces of livers.

S. no	Liver Surface	No of Livers	% of AS
1	Inferior in region of P.H.	11	30.55%
2	Rest of inferior surface	2	5.55%
3	Superior surface	4	11.11%
4	Right lateral surface	1	2.77%
5	Anterior surface	2	5.55%
6	Caudate lobe	1	2.77%
7	Region of gall bladder	2	5.55%

## DISCUSSION

A thorough review of literature revealed that majority of AS were present on antero-superior surface. AS are important as absence of their knowledge may lead a surgeon/ radiologist to misdiagnose it as an extra fissure or lobe or fluid collected in this region may mimic a cyst in this region.

In present study, majority of AS were obtained on inferior surface along with antero-superior surface. Out of 36 livers, in 13 livers, AS were present on inferior surface and out of 13, 11 were present in the region of Porta hepatis (PH) and 2 on rest of inferior surface. Similar findings were reported by Muktyaz et al [6] (14.5 % cases on inferior surface) and is contrary to study done by Macchii [7], in which AS were more on antero-superior surface.

In a study done by Faizahe et al [8], AS were located on inferior and posterior surface of right lobes in two specimens out of 40 embalmed livers. These AS, according to him, were rare as most of sulci were reported on antero-superior surface. In present study, besides transverse AS

on interior surface, four deep vertical grooves (11.11%) on inferior surface were also reported. The vertical grooves were present one on caudate lobe and two in the region on gall bladder. Vertical grooves were also reported on right lateral surface of right lobe of liver. Similar findings were also reported by Joshi et al [9] in his work on variations of liver. In his study vertical fissure was found in 30% of livers.

Embryological Basis: AS have been detected during radiological investigations. AS may be due to a developmental defect or may be acquired as a result of pressure by any structure/organ in the region of hepatic veins due to the underlying weakness caused by them.

AS on superior surface i.e. diaphragmatic surface have been frequently detected and they are present due to pressure by uneven growth of liver parenchyma which are caused by variable resistance opposed by diaphragm muscles [10]. In present study, AS besides being present on antero-superior surface, are present on inferior and right lateral surface also. They may be present because of pressure exerted by underlying colon. Moreover, AS present near PH may be due to weakness present due to underline veins in the region on PH.

## CONCLUSION

This study highlights the occurrence of variations on the liver surface. The finding of this study may be utilized by imaging specialists & surgeons respectively to avoid errors in interpretations & subsequent misdiagnosis. Although, much of the work is on segmental anatomy of liver but there are very few studies on the surface variations of liver.

**Conflicts of Interests: None**

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