

**PRESENCE OF ROUVIERE'S SULCUS AS A LANDMARK IN LAPAROSCOPIC CHOLECYSTECTOMY: A SINGLE CENTRE STUDY**

**Bhartendu Kumar\***

SKMC (Muz.), Bihar Consultant Surgeon, Dr RNT memorial clinic Muzaffarpur, Bihar- 842003

**ARTICLE INFO**

**Article History:**

Received 16<sup>th</sup> April, 2018  
Received in revised form 4<sup>th</sup> May, 2018  
Accepted 12<sup>th</sup> June, 2018  
Published online 28<sup>th</sup> July, 2018

**ABSTRACT**

A single centre, single surgeon study to look at the anatomical landmark that is Rouviere's sulcus in laparoscopic cholecystectomies. The study shows the encountered variabilities in the anatomical types of the sulcus and how it is beneficial to obtain the critical view during surgery and hence a safer dissection limiting bile duct injuries.

**Key words:**

Rouviere's sulcus, Laparoscopic cholecystectomy

Copyright©2018 **Bhartendu Kumar**. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

**INTRODUCTION**

Laparoscopic cholecystectomy is now the gold standard treatment for gallbladder stones or cholecystectomy. A common problem in difficult cases is accurate identification of the anatomy of the common bile duct (CBD). Bile duct injury is a known and catastrophic complication during a laparoscopic cholecystectomy.

In 1924, Henri Rouviere French anatomist described a 2-5-cm sulcus, running to the right of the liver hilum anterior to the caudate process, and usually containing the right portal triad or its branches. He used it as a reference point to guide the commencement of safe liver dissection. Dahmane *et al* described Rouviere's sulcus to be present in 82% of normal livers. The sulcus lies oblique to the anterior, inferior, and external edge of the liver in 97% of cases, and horizontal in 3%.

RS is a useful, but often ignored, anatomical landmark for beginning dissection of Calot's triangle, or to obtain the "critical view" and also for confirming its location. Despite this, its usefulness is not widely known or appreciated by laparoscopic surgeons.

**Aim**

The aim of our study was to determine the frequency of the Rouviere's sulcus (RS), its description, and its relevance to techniques in laparoscopic cholecystectomy.

\*Corresponding author: **Bhartendu Kumar**

SKMC (Muz.), Bihar Consultant Surgeon, Dr RNT memorial clinic Muzaffarpur, Bihar- 842003

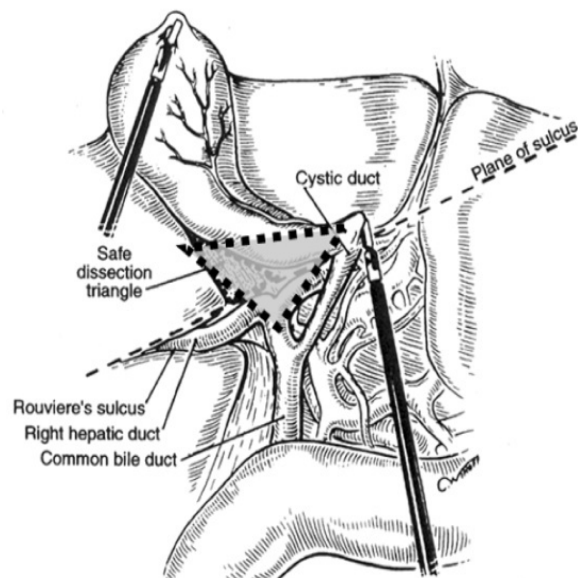
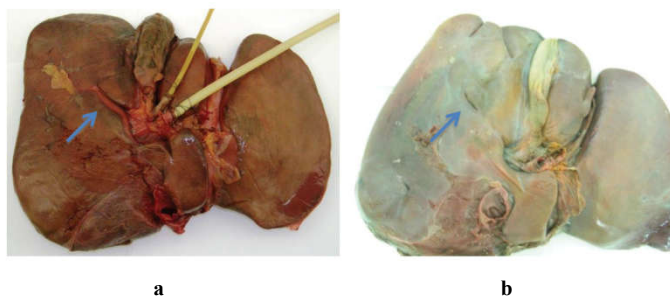


Fig 1 Depicting Plane of RS and safe dissection triangle

**MATERIALS AND METHODS**

This is a single centre retrospective study based on the observation of a single laparoscopic surgeon over the period starting from March 2015 to January 2016. The steps and laparoscopic equipment including the optics remained consistent in all the surgeries performed. 176 continuous cases irrespective of gender and body characteristics were included in the study over that period of time.

The open type of sulcus was defined as a cleft in which branches of the right hepatic pedicle were visualized and the sulcus was open throughout its length. Partially fused was defined as the one in which the sulcus was open only in its lateral end and the closed RS was defined as those which were completely closed or not visible at all.



**Figure 2** (a) Open type of Rouviere's sulcus with visible right portal pedicle. (b) Partially fused Rouviere's sulcus open at its lateral end. (marked by blue arrows)

Reproduced with permission from Anatomy and Surgical Relevance of Rouviere's Sulcus- Raja Dahmane *et al* 2013

## RESULTS

Out of the 176 cases observed 140 (79.5%) had RS clearly defined before starting the dissection to obtain the critical view.

Out of the 140 livers with the RS, 46 (26% of total) were found to have partially fused RS and 94 were completely open. 36 (20.5%) livers had completely closed RS or was not identified during the dissection.

Of the 140 cases in which RS was identified before the dissection there was no subsequent bile duct injury (BDI) or hepatic duct injury during the whole procedure.

In the 36 cases where the RS was not identified, absent or completely closed there were 4 minor to moderate BDI of which one required an open bile duct exploration. The other three on interval MRCP did not show any significant contracture.

## DISCUSSION

Most of the classic anatomical literature does not include data on the RS. The advantage of identifying RS before beginning the dissection in laparoscopic cholecystectomy lies in the anatomical fact that the cystic duct and the cystic artery lay anterosuperior to the sulcus and the common bile duct lays below the level of the RS in almost 80% of the cases where RS can be identified as shown by anatomists and surgeons in the past and also reiterated in this study.

Hugh had shown minimal common bile duct injury during laparoscopic cholecystectomy by beginning the dissection ventral to the RS. And similar results were achieved during this study at our centre. Identifying RS as a landmark has been shown to be beneficial in facilitating good vascular control in right sided liver resection as well but is beyond the scope of this article.

## CONCLUSION

Rouviere's sulcus is a frequent anatomical landmark present in around 80% of the livers, either as open, partially open or fused type.

RS provides an easy and mostly consistent reference point for safe laparoscopic cholecystectomy.

It remains vital however as in all surgeries to achieve the critical steps in the procedure safely. However anatomical identification of Rouviere's sulcus in laparoscopic cholecystectomy seems to be a major step in preventing BDI. It is also important to remember that the sulcus may not be present in 20% of normal individuals, and sometimes difficult to identify in livers that are diseased or in presence of dense fibrosis.

## Conflicts of interest

None declared.

## References

- H. Rouviere, "Sur la configuration et la signification du sillon du processus caudé," *Bulletin et Mémoires de la Société Anatomique de Paris*, vol. 94, pp. 355–358, 1924.
- H. Rouviere and A. Delmas, *Anatomie Humaine Descriptive, Topographique Et Fonctionnelle*, Masson, Paris, France, 13<sup>th</sup> edition, 1991.
- T. B. Hugh, M. D. Kelly, and A. Mekisic, "Rouviere's sulcus: a useful landmark in laparoscopic cholecystectomy," *British Journal of Surgery*, vol. 84, no. 9, pp. 1253–1254, 1997.
- Dahmane R, Morjane A, Starc A. Anatomy and surgical relevance of Rouviere's sulcus. *Scientific World Journal*. 2013; 2013:4, Article ID 254287.
- K. Singh and A. Ohri, "Anatomic landmarks: their usefulness in safe laparoscopic cholecystectomy," *Surgical Endoscopy and Other Interventional Techniques*, vol. 20, no. 11, pp. 1754–1758, 2006.
- D. Olsen, "Bile duct injuries during laparoscopic cholecystectomy," *Surgical Endoscopy*, vol. 11, no. 2, pp. 133–138, 1997.
- S. Nagral, "Anatomy relevant to cholecystectomy," *Journal of Minimal Access Surgery*, vol. 1, no. 2, pp. 53–58, 2005.
- S. M. Strasberg, J. Belghiti, P.-A. Clavien *et al.*, "The Brisbane 2000 terminology of liver anatomy and resections," *HPB*, vol. 2, no. 3, pp. 333–339, 2000.
- M. A. C. Machado, P. Herman, and M. C. C. Machado, "A standardized technique for right segmental liver resections," *Archives of Surgery*, vol. 138, no. 8, pp. 918–920, 2003.

### How to cite this article:

Bhartendu Kumar (2018) 'Presence of Rouviere's Sulcus as a Landmark in Laparoscopic Cholecystectomy: A Single Centre Study', *International Journal of Current Advanced Research*, 07(7), pp. 13971-13972.  
DOI: <http://dx.doi.org/10.24327/ijcar.2018.13972.2515>