ORIGINAL ARTICLE

To determine the frequency and type of Rouviere's sulcus in our population

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Abstract:
Objective: The purpose of our study is to determine the frequency and type of Rouviere's sulcus in our population.
Study design: Cross-Sectional observational study.
Setting: Surgical Department of Abbasi Shaheed hospital Karachi.
Duration: From January 2019 to December 2019.
Material and Methods: All the patients with symptomatic gallstones undergoing Laparoscopic Cholecystectomy were included. The presence and type of Rouviere's sulcus was recorded before starting dissection. Open type was defined as a sulcus in which right hepatic pedicle was visualized. Fused type was defined as a sulcus in which the pedicle was not visualized.
Result: Out of 380 patients, 332(87.3%) were female and 48(12.6%)were male. Male to Female ratio was 1:8.Age of the patients ranged from 16 years to 74 years with mean age of 42 years. Rouviere's sulcus was present in 294 patients(77.5%),out of which 69(23.4%)were found to have Open type and 225 (76.5%)have Fused type. Rouviere's sulcus was not found in 86(22.6%).
Conclusion: Rouviere's sulcus is an important landmark that can be defined as Open and Fused type. Identifying the sulcus before commencing dissection in Callot's triangle can help in preventing bile duct injury, thus improving surgical outcome.

Keywords: Rouviere's sulcus, Common bile duct injury, Callot's triangle.

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Introduction:
The most widely accepted,adopted,practiced and gold standard treatment for symptomatic management of Cholelithiasis is Laparoscopic Cholecystectomy.[1] It has been under practice as early as 1980s. Compared to open cholecystectomy, laparoscopic cholecystectomy is linked to higher incidences of vascular,biliary and visceral complications.[2] The reported incidences of surgical complications range from 0.6% for Bile duct injury, 0.14% for vascular injury and 0.25% for bowel injury. With the advent of laparoscopic surgeries, having high definition monitoring and reduction in learning curve, a substantial decrease in bilio-vascular injury has been observed.[3]

Although the occurrence of complications in laparoscopic cholecystectomies is less than 0.1%, these 0.1% are serious especially bile duct injury are life threatening complications.[4] Therefore, surgeons should put in every effort for minimizing risk of injury. As such, identifying hepatobiliary anatomy accurately is of prime importance. Majority of bile duct injuries have been attributed to wrongful identification of biliary anatomy either due to mis-interpretation or faulty knowledge of anatomy.[5] A reason for such mistakes is the fact that anatomical structure exist in a 3-D axis, however surgeon's view is basically 2-D. Some other causes of increased bile duct injury risks are inflammation or infection in the course of acute cholecystitis, abberations in anatomy, surgical inexperience and

Figure 1: Open Type

Figure 2: Closed Type

Figure 3: Absent

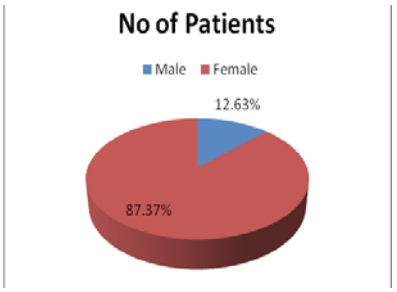

Figure 4:

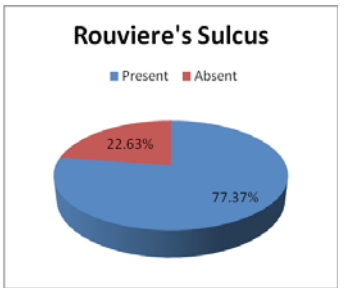

Figure 5:

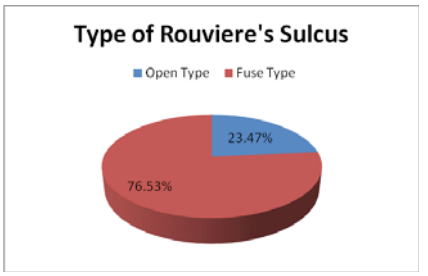

Figure 6:

Hemorrhage.[6] Even though multiple strategies have been introduced for limiting iatrogenic biliary tract injuries, the most important method for decreasing such complications are surgical vigilance, thorough anatomical knowledge and understanding and meticulous methods of dissection.[7]

However, the unanimous advantages for majority of the patients were slightly compromised because of the fact that the risk of complications have been observed since the initial days of laparoscopic cholecystectomy.[8] Multiple treatment protocols are being proposed in order to decrease such serious complications. One way to reduce these complications is the use of anatomical markers seen as referencing point.[9] One such most vital reference point is the hollow which was first used in 1924 by Henri Rouviere.[10] This reference point is also utilized as reference point in order to guide initiation of safe dissection.[11] Rouviere is a reference point which is a cleft present in Liver which progress to right of hilum in front of caudate process having right portal pedicle.[12] It accurately and precisely helps in determining plane of common bile duct.[13] This rouviere reference point is reported to be observed in around 78% of the population residing in developed countries.[14]

Materials and Methods:

This is a cross sectional observational study of 380 patients who presented with symptomatic gallstones and underwent laparoscopic cholecystectomy, after taking informed consent. The study was conducted at Surgical Department Of Abbasi Shaheed Hospital, from January' 2019 to December' 2019. The operation was done under General Anesthesia with classical 4 ports. Rouviere's sulcus was observed before starting dissection. The frequency and type of sulcus was recorded. The open type was defined if right hepatic pedicle was visualized in the sulcus (Fig 1). If right hepatic pedicle was not visualized or visualized only at its medial side or lateral side then it was defined as fused type(Fig 2). If Rouviere's sulcus was not found then it was marked as absent(Fig 3).

Result:

A total of 380 patients underwent laparoscopic cholecystectomy during the period of 1 year, out of them 332(87.3%) were females and 48(12.6%) were males. Male to Female ratio were 1:8(Fig 4). Age of the patients ranged from 16-years to 74-years with mean age of 42-years. Out of 380-patients Rouviere's sulcus was present in 294(77.5%) patients, in which 69(23.4%)

were found to have open type and 225(76.5%) have fused type. Rouviere's sulcus was not found in 86(22.6%) patients (Fig 5).

Discussion:

Laparoscopic Cholecystectomy is now the gold standard treatment for gallstones with many advantages as compared to open procedure, but it has resulted in more complex or unknown complications in the Era of open surgery. One of the most serious complications is bile duct injury, due to inherent limitations of laparoscopy. The significant morbidity related to this operation seemed to be due to lack of knowledge of laparoscopic anatomy of gallbladder pedicle, 2-dimensionalvision and lack of tactile feedback.[15] One of the most serious complications is bile duct injury.[16,17] For safe dissection ,it is emphasized to achieve critical view of safety that is only 2 structures should be going to gallbladder. In addition to this, in recent reports, a reference point is increasingly described, that is Rouviere's sulcus. This sulcus was hardly seen and described in open surgery, and is seen very clearly in Laparoscopic surgery.[18] Henry Rouviere in 1924, described this Rouviere's sulcus as a reference point for starting the safe dissection because cystic duct and cystic artery lay anteriosuperior to the sulcus[19] and common bile duct lays below the sulcus.[20] Hugh has shown minimal bile duct injury during laparoscopic cholecystectomy by beginning the dissection ventral to the sulcus, so the use of Rouviere's sulcus as an extra biliary landmark especially in difficult operations can be very useful. Rouviere's sulcus remains relatively unaffected by inflammation and fibrosis.[21]

Conclusion:

Rouviere's sulcus is an important and early identifiable extrabiliary landmark for safe dissection of Callot's triangle during laparoscopic cholecystectomy, which can be defined as open or fused type in most patients. It can help in reducing the bile duct injury and thus improving surgical outcome.

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Role and contribution of authors:

Dr Rahil Mahmood Ur Rahman, collected the data, references and did the initial write up.

Dr Bushra Tasneem, collected the data, and helped in introduction writing.

Dr Aisha Tasneem, collected the references and helped in tabulation of data.

Dr Erum Ghani, collected the refenecs and helped in discussion writing.

Dr Sana Salamat critically review the article and made useful changes.

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