# TRIANGLE OF CALOT:
# LET'S HAVE A CONVERSATION

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## WHO WAS CALOT? 1

1861-1944
Jean-François Calot was a French physician and anatomist born in Arrens-Marsous, a small farming community in the Hautes-Pyrennes, a region of northern France close to Spain. Dr. Calot obtained his bachelors degree in 1880 at the Saint-Pe de Bigorre and his medical degree from the University of Paris where he also worked as an anatomy prosector.
His treatise, "De La Cholecystomie," was written in 1891 and was his doctoral thesis from where "The Triangle of Calot" originated.
Dr. Terrier, a French surgeon, was Calot's mentor and was among the earliest surgeons to adopt the open cholecystectomy after Dr. Carl Langenbuch introduced it in 1882.

## WHEN WAS THE TRIANGLE OF CALOT FIRST DESCRIBED? 3

In 1891, the groundwork for the identification and description of this triangular space was laid out during Calot's dissections in the cadaver laboratory. He also observed his mentor, Dr. Terrier, during four open cholecystectomies. Dr. Calot further stated in his 1891 treatise that he communicated with Carl Langenbuch several times.
It is safe to assume that given the encouragement from his mentor, Dr. Terrier, to study hepatobiliary anatomy, Calot's work as a prosector in the cadaver laboratory, and the knowledge Calot gained from communicating with Langenbuch, his mind was very prepared to identify those three important structures that made up the triangle. He presented his findings to the German Surgical Congress in 1891.

## WHAT IS THE IMPORTANCE OF THE TRIANGLE OF CALOT? 5

Identifying the landmarks of the Triangle of Calot is one of the critical steps to a successful and uncomplicated cholecystectomy. Of note is the fact that an area occupying two [2] cubic centimeters of space around the cystic duct/gallbladder junction contains more anomalies than any other anatomic area in the body.
In addition, displaying Strasberg's Critical View of Safety [CVS] in the general location of Calot's triangle, and knowledge of the recently described Hepatocystic Quadrangle of Ozobia [HCQUOZ], will go a long way in helping to reduce major hepato-biliary injuries to near zero %.
Of course, the experience of the surgeon, local anatomic distortions from acute and chronic inflammations, and immediately available help in difficult cases from more experienced surgical staff have to be factored in.

## WHAT IS THE TRIANGLE OF CALOT? 2

The Triangle of Calot is an area in the Hepatocystic Space located in the right upper quadrant of the abdomen. The triangle is formed by two attachments of the gallbladder to the common hepatic duct [CHD] at the hepatoduodenal ligament. The CHD forms the third part of this triangular anatomic structure. This area was first described by Calot in his 1891 treatise in which he described an isosceles [equilateral] triangle with the following structures:
The cystic duct/The cystic artery/The common hepatic duct.
An unknown anatomist/surgeon named this area the Triangle of Calot and, more confusing still, the undersurface of the liver was later introduced as one of the boundaries.

## WHY IS THERE NO UNANIMITY IN THE DESCRIPTION OF THE TRIANGLE OF CALOT? 4

If you follow Calot's original unlabeled diagram [fig.1] used in his presentation to the German Surgical Congress in 1891, it is clear that the upper boundary of the isosceles [equilateral] triangle described by him was meant to be the cystic artery. It is not clear the rationale for introducing the undersurface of the right lobe of the liver as the upper boundary.
At surgery, exposure of the cystic artery requires dissection, at times difficult and bloody. The undersurface of the right lobe of the liver is easily discernible.
Was it out of convenience that the undersurface of the right lobe of the liver was subsequently chosen as the upper boundary? Calot's treatise was not written in modern French and an English version of it is not available. Could this lack of a credible English translation has led to an interpretation bias and confusion?

## WHY DO WE NEED A CONVERSATION ON THE TRIANGLE OF CALOT ? 6

There has been a growing trend to abandon eponyms in Anatomy, Medicine, and Surgery texts. If successful, it might get rid of the confusion surrounding terms like the Triangle of Calot, which is also in some texts referred to as one of the following: Hepatocystic Triangle, The Modern Triangle of Calot, or Cysto-Hepatic Triangle. Calot's equilateral or isosceles triangle as presented to the German Surgical Congress in 1891 was represented by the cystic artery, the cystic duct, and the common hepatic duct [fig.2]. Both hepatocystic and cystohepatic triangles refer to different anatomic nomenclatures and should be described separately by their boundaries and not confused with Calot's original description in 1891.



JEAN-FRANCOIS CALOT
1861-1944

CALOT'S UNLABELED ORIGINAL DIAGRAM
FROM HIS
1891 THESIS

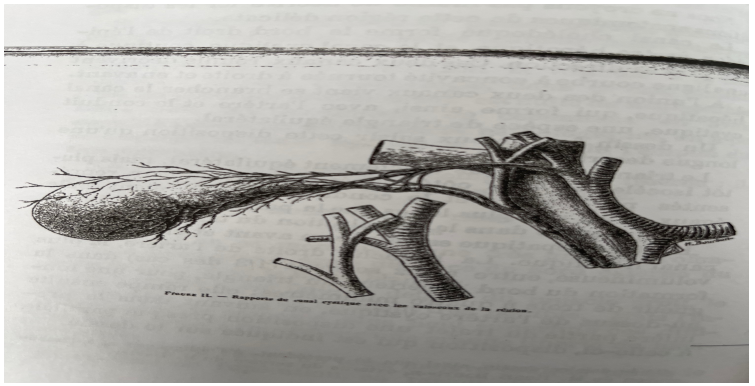


FIGURE 1

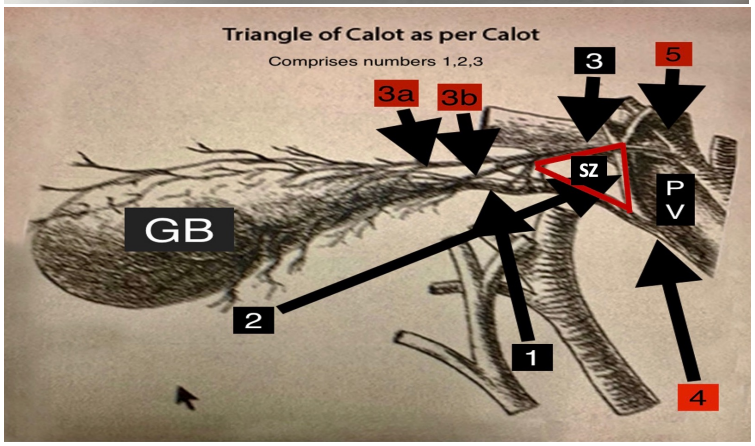



FIGURE 2

**LEGEND**
1. Cystic Duct 2. Common Hepatic Duct 3. Cystic Artery 3a. Cystic Artery, Anterior Branch 3b. Cystic Artery Posterior Branch 4. Common Bile Duct 5. Right Hepatic Artery Abbreviations: **GB-** Gallbladder **PV-** Portal Vein **SZ-** Safe Zone [CALOT'S TRIANGLE]

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