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Editorial Temático

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O uso da colangiografia intraoperatória durante a realização da colecistectomia – uma controvérsia de longa duração

The use of intra-operative cholangiography during the course of cholecystectomy – a long lasting controversy

This issue of “Revista Portuguesa de Cirurgia” publishes a paper dealing with the long lasting controversy on the use of intra-operative cholangiography during the course of cholecystectomy.

The lack of consensus still exists, despite many studies – properly designed – regarding its use either as a “selective” choice or as a “routine” step in the performance of this surgery; this controversy existed already during the era of “open” cholecystectomy and returned to the front line of discussion with the introduction of the Laparoscopic approach.

The arguments defenders of each choice claim as being “definitive” have been deeply and carefully studied, as well as the results of large, double blind randomised studies; despite all this, there is no consensus neither strong Scientific Evidence to have one of the options being the “Evidence based One”.

Intra-operative cholangiography implies opening a structure – generally a duct which is assumed to be the cystic duct, very rarely the gallbladder itself – where a narrow catheter is inserted and dye injected; after this, fluoroscopy or hard copy X-ray images are obtained to visualise the whole biliary tree anatomy.

My point of view calls the attention, to start, to the fact that this is an invasive technique; besides, it has a not so small rate of failure to perform (14 to 18%)(¹). Studies have also been done regarding the time it takes to perform, when success is obtained; the average time is 10 minutes. This would lead to continuous work in the operating theatre for 3,7 days in order to detect intra-operatively a bile duct injury. This, by looking at an average of good series, as some others, although from groups performing cholangiography routinely, state much higher values, up to 27’(²).

Another claim is that intra-operative cholangiography detects anomalous biliary anatomy, helping the surgeon to be aware of it and avoiding lesions; this is a fallacious view as in a few cases its performance is already



a cause for lesion when the opening is done in the wrong, not properly recognised, duct. Tearing a duct, causing pancreatitis and causing cholangitis have also been described.

The main cause of Bile Duct injuries has been shown to be the misinterpretation of what is being viewed⁽³⁾. It has also been shown that this misinterpretation is similarly prone to exist when looking at the video screen, while performing the cholecystectomy, as when looking at the same or another screen to interpret the fluoroscopy or even when looking at the x-ray films.

The issue at discussion here is the prevention of bile duct injuries but it arose from the problem of finding common bile duct stones. Palazzo, in 1997, proposed a “Risk Table” which is still valuable. (Table 1)⁽⁴⁾

TABLE 1

| |
|---|
| Low Risk – (Stones in 2-3% of cases) |
| No story of stones migration |
| Normal liver function tests |
| Abdominal US – CBD ≤ 7mm Ø |
| Medium Risk – (Stones in 20-40% of cases) |
| Story of cholangitis or pancreatitis |
| γGT and/or transam. and/or AF > 2N |
| Abdominal US – CBD 8-10mm Ø |
| High Risk – (Stones in 50-80% of cases) |
| Recent story of cholangitis, pancreatitis, jaundice |
| AF ↑ (> 2N) |
| Abdominal US – CBD > 10mm Ø |

Applying this risk score, a surgeon can define a tactical approach for his/her patients who are going to be submitted to Laparoscopic Cholecystectomy.

Patients falling in the “Low risk group” should have surgery with no further studies; patients in the “Medium risk group” are the ones on whom surgery shall be complemented with Intra-Operative Cholangiography; patients in “High risk group” shall have individualised approach; depending on the available local expertise he/she can fall in one of the following categories:

- 1) LapChole after Endoscopic Retrograde Cholangiography (with removal of stones if found)
- 2) Diagnostic Magnetic Resonance Cholangiography, followed by therapeutic Endoscopic Retrograde Cholangiography if stones found
- 3) Intra-operative exploration of common bile duct.



A technical fact is that, IOC when to be done must be dynamic, with fluoroscopy, in order to not only show the anatomical map of the biliary tree but also its way of working and flowing.

Another important point to remember is that “Cholangiography is not a substitute for meticulous dissection, and injuries to the CBD can occur before cystic duct dissection reaches the point at which cholangiography can be performed”⁽⁵⁾.

“Critical view of safety” (CSV), introduced by John Hunter in 1995 and “adopted” by Strasberg is a mandatory step when performing LapChole; it is achieved when the surgeon, after meticulous and careful dissection, sees only two structures leaving (or joining) the gall bladder. These must then be the cystic duct and artery. John Hunter was clear in 2001 defending that “if critical view of safety is not obtained, this is an absolute indication for conversion, or for intra-operative cholangiography to define better the anatomy”⁽⁶⁾.

There are possible alternatives which overrule, particularly, the drawbacks or “disadvantages” of intra-operative cholangiography. One of them is intra-operative ultra-sonography (IOUS); it is performed with special multi-frequency probes, some of which also have Doppler capabilities; these probes exist for open or laparoscopic use. IOUS doesn't need injection of any contrast or the use of any radiation.

It cannot, also, give raise to complications by itself as it is not invasive, not entering any anatomical structure of the biliary tract.

It takes less time to perform, but is quite complex to learn and the specific equipments are expensive, although being possibly used for other purposes in the surgical setting, laparoscopic or open. A major disadvantage, though, for what is at stake, is that it is not good at all for definition of anatomy.

The discussion goes as far as to bring back a “re-proposal” of the concept of dealing only with the biliary stones and not performing the cholecystectomy, if surgery seems problematic. This simpler and apparently logic approach, was suggested during the end of the decade of 1980's completing the concept of minimal aggression and was, then, proposed to all cases of biliary lithiasis; it was, at that time, applied by some, performing the opening of the gall bladder, removal of all stones and closing the wall of the organ, all of this through a laparoscopic approach. Unfortunately, within two years, basically all of those patients had a recurrence, reforming calculi within the gall bladder.

What is now proposed is different; based on the experience of gynaecologists (endoluminal ablation of the endometrial mucosa), it is suggested to do the same within the gallbladder, not with heat, because of the thin wall, but with water jets which eliminate the mucosa. This work has been shown possible in live animals and fresh human gallbladder specimens. Its rationale is that, using this technique, there will be no need to deal with biliary ducts and arteries, as the approach is to be done through the fundus of the gallbladder, eliminating any danger of lesions.⁽⁷⁾

Other new options are coming, as alternatives for the “classic” cholangiography; one of the most promising is the use of “Near infra-red fluorescence cholangiography”. This is a technique which implies intra-venous injection of a special contrast, apparently harmless, which allows visualisation of the ductal structures, both bile ducts and arteries, under special infra-red light. As this special light is necessary the tools which allow that change (from normal laparoscopic illumination) without further disturbance in the operating settings already exist; what the surgeon has to do is only to switch from normal light to the one giving the fluorescent



visualisation and then looking at the structures, being able to touch and to move it around if any doubts subsist.⁽⁸⁻¹¹⁾

Preliminary studies are very promising and the use of this new technology may, finally, put an end to the continuous controversy of routine⁽¹²⁻¹⁵⁾ or selective⁽¹⁶⁻¹⁸⁾ cholangiography.

This is an important issue to pay attention to, and to solve definitely, specially because some other studies also show that, despite all long standing discussion of the matter, many surgeons are still not much aware of the problems related to it⁽¹⁹⁾ and it has been demonstrated that in the majority of cases, the main reason relates to misinterpretation of what the surgeon is seeing⁽³⁾.

No doubt the key for safety while performing a cholecystectomy and the best way to prevent bile duct injuries is proper training and education, knowledge of all possible problems and anomalies, use of the Critical view of safety, humbleness and proper communication within the room, correct and liberal selective use of intra-operative cholangiography.

In the near future, paying great attention to the rising introduction of new non-invasive techniques may provide new ways to improve the outcomes.

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