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Original Research Article

Surgical practices during cholecystectomy in Algeria: results of a survey

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ABSTRACT

Background: The cholecystectomy is one of the most practiced surgeries; the learned societies published guidelines to improve surgical practices. Guidelines are sometimes not followed, either by negligence, by lack of means or adequate professional environment. So, to know the real practices of surgeons, a survey was conducted.
Methods: An anonymous national survey involving all practicing Algerian surgeons was conducted. At the end of the survey, all data were captured and processed using the SPSS v20 software; χ^2 tests were used to compare different groups of surgeons.
Results: Only 122 responses were retained, twenty-two percent of surgeons perform open cholecystectomy. No surgeon performed routinely cholangiography, 43% extracted the gallbladder using extraction disposal, 18% performed systematic abdominal cavity drainage, all surgeons send the gallbladder to histology for examination and postoperative antibiotic prophylaxis was routinely prescribed by 69% of surgeons. The average postoperative hospitalisation recommended by surgeons was 1.65 days (0-5) days. The experience of the surgeon or his position was associated with lower rates of systematic prescription of antibiotic prophylaxis, and with a lower duration of postoperative hospitalisation.
Conclusions: We recommend publication of the guidelines of good practices adapted to the socio-professional and economic context of countries.

Keywords: Middle income country, Best practice, Gallbladder, Laparoscopy, Surgery, North Africa

INTRODUCTION

With more than 200 surgeries per 100,000 inhabitants, cholecystectomy "CH" is one of the most performed surgical procedures in the world, the first CH was performed by Carl Johann August Langenbuch in 1882, and already six years after the first biliary tract injury was described by Riedel in 1888.[1,2] The CH has largely evolved, after a large diffusion of minimally invasive laparoscopic surgery at the end of the 20th century; we are actually in the area of robot-assisted surgery, whose costs are in permanent reduction allowing a better profitability of this technology.[3] With the technical development of CH, several surgical learned societies have published regular updates to improve surgical practices.[4] In the particular socioeconomic and professional context in Algeria, are these recommendations taken into consideration? Despite the fact that this surgery is widely performed, we did not find a published survey analyzing practices concerning CH in the North African region.

METHODS

An anonymous national survey involving all practicing Algerian surgeons was conducted. Any digestive , general and visceral surgeon practicing in Algeria was eligible for this survey, surgeons in training "residents"

and Algerian surgeons exercising overseas was systematically excluded.

The aim was to analyse some practice in accordance with the recommendations of the Society of American Gastrointestinal and Endoscopic Surgeons who published a guideline in 2010.[4]

This elaborated form was an electronic one; it was performed using the open electronic platform "Google Form", the conception of the form was made by a surgeon and he was the first participant to this survey, considering his participation he was excluded from the seizure of the data. The analysis and interpretation of data was made by a bio-statistician and a surgeon.

The form consisted of two parts, the first concerning the surgeon's Wilaya of exercise, the rank of health structure of practice, his professional position , and the year of his graduation , the second part concerning his practices during CH and the questions concerned the use of laparoscopy or open surgery to perform CH, the number of Trocars used, the technique to access the peritoneal cavity, the surgical technique, the use of intraoperative cholangiography "IOC", the technique of extraction of the gallbladder, systematic gallbladder macroscopic and histological examination, the systematic abdominal cavity drainage, systematic use of postoperative antibiotic prophylaxis, and the optimal duration of postoperative stay in the case of optimal patient with no intraoperative incidents or postoperative complication. At the end of the survey a question was asked to surgeons about the occurrence during their professional practice of an operative bile duct injury.

The language of instruction of surgeons in Algeria is French; the French was used to draft this form. This electronic form was distributed by email to all surgeons in the authors Mail lists, those first contacted surgeons had the mission not only to participate in this survey but also had the mission of distributing the electronic form to their surgeon colleagues. All incomplete responses were excluded.

Statistical analysis

The survey started on the 1st November 2016 and ended on the 1st September 2017. At the end of the survey, all data were captured and processed using the SPSS v20 software (IBM Inc., Chicago, IL, USA), a χ^2 tests were used to compare some surgical practices in different groups of surgeons, a ($p<0.05$) was considered statistically significant.

RESULTS

In this period of survey, 144 responses were received, of which 22 were excluded, 122 were retained, thirty six states "Wilayas" of the 48 of the country were represented at least by a participating surgeon, 13.9% (n=17) were surgeons practicing in a university-hospital structure as a university teaching surgeon "HUChir", 75.4% (n=92) practicing in a public health institution "PUBChir", surgeons practicing in a private health structure "PChir" accounted for 10.7% (n=13) , forty-three percent had over ten years of professional experience.

Twenty-two point one percent still perform open CH, 61.5% perform laparoscopic cholecystectomy "LCH' with 4 trocars, and 16.4% with just 3 trocars. More than 98% (n=120) of surgeons approach the artery and cystic duct first (retrograde approach), the two surgeons using the anterograde approach used open surgery to perform CH.

Regarding surgeons using laparoscopic surgery (n=94), the technique of access to the peritoneal cavity used was open technique by 81% of surgeons (n=76) and a blind technique the Veress needle by 19% of surgeons (n=18), no surgeon used impaction to access peritoneal cavity. No surgeon performed IOC systematically, but 30% was ready to do it if they have material means, 2% admitted not knowing how to perform IOC by laparoscopy, 8% realized it only for the sake of lithiasis of the main bile duct.

Extraction of the surgical specimen by surgeons using laparoscopy was systematically made through an extraction device by 44% (n=41) of surgeons, 46% (n=43) do it occasionally, and 12% (n=11) extracted the gallbladder permanently without any protection disposal. All the surgeons sent the gallbladder of the CH for histological study and 64.8% address it to an external laboratory because of the unavailability of a histopathology laboratory in their health structures. 51.6% of surgeons routinely examine macroscopically the interior of the gallbladder at the end of the procedure.

The drainage of the peritoneal cavity at the end of the procedure was done systematically by 18% (n=22) of the surgeons and 68.9% (n=84) of surgeons prescribed antibiotic prophylaxis systematically at the postoperative period. The optimal duration of postoperative stay recommended by surgeons varies from 0 to 5 days with an average of 1.65 days.

With regard to operative injuries of the bile ducts, 36.1% (n=44) surgeons had to deal with this complication at least once during their careers and 23.9% (n=29) of surgeons recognized this injuries during the CH.

Data was crossed of a side related to the surgeons, the experience of the surgeon, his position and if he practiced laparoscopy to perform CH or not. On the other hand his surgical habits and practices. Results are reported in a table (Table 1).

Thus, there was an association between the surgeon's position, his professional experience "greater than 10 years" and the duration of postoperative hospitalization and the systematic postoperative antibiotic prophylaxis.

Table 1: Statistic evaluation of the association between surgeon characteristics and surgical practices.

	HUchir (n=17)	Non HUchir (n=105)	P value	Experience >10 years (n=53)	Experience <10 years (n=69)	P value	Laparo-scopic surgeon (n=95)	Open surgeon (n=27)	P value
The use of laparoscopy	(n=15) 88.2%	(n=80) 76.2%	0.267	(n=42) 79.2%	(n=53) 76.8%	0.748	-	-	-
Abdominal systematic drainage	(n=01) 5.9%	(n=21) 20%	0.160	(n=07) 13.2%	(n=15) 21,7%	0.224	(n=18) 18.9%	(n=4) 14.8%	0.662
Antibiotic prophylaxis	(n=4) 23.5%	(n=80) 76.2%	$<10^{-3}$*	(n=27) 47.2%	(n=59) 85.5%	0.000*	(n=64) 74.1%	(n=20) 67.4%	0.507
Postoperative stay (day)	(n=17) Av=0.82 SD=0.529	(n=105) Av=1.78, SD=0.920	$<10^{-3}$*	(n=53) Av=1.40 SD=0.927	(n=69) Av=1.84 SD=0.901	0,.012*	(n=95) Av=1.41 SD=0.722	(n=27) Av=2.48, SD=1.122	$<10^{-3}$*
Occurrence of a bile duct injury	(n=06) 35.3%	(n=38) 36.2%	0.943	(n=25) 47.2%	(n=19) 27.5%	0.025*	(n=33) 34.7%	(n=11) 40.7%	0.566

HUchir : university teaching surgeon, Non HUchir : Non university teaching surgeon, P: χ^2, *: (p< 0,05), Av: average, SD: standard deviation.

HUChir tended to hospitalize less and use antibiotic prophylaxis less systematically in the postoperative period, the four surgeons (3.3%) performing outpatient CH are HUChir. The same observation was made among practitioners with more than 10 years of professional experience, they tend to hospitalize less postoperatively and to use less antibiotic prophylaxis in postoperative period.

What was not expected is to note that surgeons performing LCH used systematic abdominal cavity drainage as much as conventional surgeons. However, the use of the laparoscopic or open approach, the blind or open laparoscopic approach, the use of an extraction device for the gallbladder during laparoscopy, and systematic drainage are habits that are not statistically related to surgeon's characteristics.

Younger surgeons less than 10 years of experience do not perform laparoscopic CH more than surgeons with more than 10 years of professional experience. The surgeon's characteristic does not influence on the occurrence of an iatrogenic biliary tract injury.

DISCUSSION

Laparoscopy is definitely the reference technique to perform CH.[4] This, even in developed countries worldwide, CH still performed by open surgery, In Japan, 10,6% of CH is performed by open surgery.[5] Also, the survey reveals that the number of surgeons performing this intervention by open surgery represents 22.1%. This rate cannot only be justified by the lack of resources or dedicated training, but also by the conviction of some surgeons and the decision of some patients.

It is important to highlight LCH economical benefits, its advantages is perceptible even in developing countries.[6] In Algeria, the study shows that the seniority of the surgeon and his position has no influence on the surgical used approach to perform this surgery.

Moreover, the choice between the laparoscopic approach with three or four trocars are left to everyone's habits, many publications advocate CH with three-trocars, but none is sufficiently solid to prove it.[7,8] This survey demonstrates that 21% of the participating laparoscopic surgeons are using three trocars to perform LCH.

None of them is performing CH with a single-trocar or through a natural orifice. The choice of approaching technique to access the peritoneal cavity is left to the discretion of the surgeon, because it was found that all techniques, open or closed sound comparable and safe.[4,9]

One of the safety rules concerning CH is the identification of the cystic duct, the cystic artery, and the main bile duct, this implies the retrograde approach of the gallbladder with dissection and identification of anatomical elements, to adopt the critical view of safety; the dissection of 1/3 of the gallbladder must be made and ensure that just "one" cystic artery and "one" cystic duct connect the gallbladder to the hepato-duodenal ligament.[4,10]

The present survey illustrate that 98% of the followed surgeons perform routinely the retrograde gallbladder dissection. The left 2% use the anterograde approach to perform open CH.

It was exposed that the use of IOC will reduce the severity of the lesion in case of operative biliary tract

injury, and increase the chance of detecting this lesion at the same operative time, but cannot prevent it, or reduce it occurrence.[4,10] However none (0%) of the surgeons performed IOC systematically, 30% was convinced of the need to do it systematically and do not do it because of a lack of means, 8% will do it only in case of suspicious of a commune bile duct lithiasis. Nevertheless a German survey shows that even if the material resources are permanently available, only 2.6% of surgeons perform this imaging permanently and 53.2% never performed IOC.[10]

Present survey revealed that only 43% of surgeons performed gallbladder's extraction through a "bag" protecting extraction device, and 12% does so without a bag, currently there is no clear recommendation regarding the risk of galls stones swarming, surgical wound infection or tumour dissemination in unrecognized gallbladder cancer.[4,11,12]

The macroscopic examination of the gallbladder at the end of CH and the sending of the product for an histological study is an absolute necessity, since more than 37% of gallbladder cancers are not suspicious even after examining the inside of the operative part.[13] This notion seems to be acquired by surgeons who participated in this survey, all surgeons carry out a histpathological study, even those who do not have a laboratory in their health structure 64.8% (n=79).

The systematic abdominal cavity drainage after uncomplicated LCH, is unnecessary, a cause of prolongation of postoperative hospital stay and a source of postoperative complications.[14-16]

In present survey 18% (n=22) of surgeons routinely drain, looking for an association between this unjustified attitude and the characteristics of the surgeon we note a total independence, surgeons with more than 10 years experience used drain as much as the less experienced surgeons, and that HUChir, PChir and PVChir drain as much (5.9% vs 19.6% vs 23.1%) (p=0.356). Also, surgeons using laparoscopy drain as much as surgeons performing open CH.

Although the use of perioperative antibiotic prophylaxis do not reduce postoperative infection, especially surgical wound infections, this practice is widely answered among our surgeons (68.9 %), but surgeons with more than 10 years of experience are less likely to prescribe postoperative antibiotic prophylaxis (p=0.000) and HUChir prescribe less postoperative antibiotic prophylaxis (p=0.000).[17,18]

Outpatient LCH appears to be safe when conditions are met, and the necessary precautions are taken, in the survey the average stay was 1.65 days with extremes of 0 to 5 days.[4,19] The length of stay recommended outside of any complication was intimately related to surgeon's characteristics, HUChir hospitalized less post-operatively (p=0.000), surgeons with more than 10 years' experience (p=0.012) and laparoscopic surgeons also do the same (p=0.000).

The emergence of outpatient surgery in Algeria was felted with 4 participating surgeons performing outpatient LCH (3.2%), those surgeons were HUChir. With regard to operative biliary tract injuries, 36.1% of surgeons report having brought at last a biliary tract injury during their career, of which 11 are surgeons using the open surgery and 33 who perform routinely the LCH. The occurrence of this event seems unrelated to the surgical approach, open or laparoscopic. In a German national survey, the rate of surgeons having to deal with at least one biliary tract injury during the period of 12 months of exercise was 20.3%.[10]

Limitation

- The form used was an electronic form; probably the missed data forms not retained are due to a bad mastery of the computer.
- The impossibility of evaluating the number of surgeons who were reached by this survey but did not participate, therefore it was impossible to evaluate the ratio (participant surgeons/ reached surgeons).
- All good practices have not been evaluated to avoid congestion of the form.

CONCLUSION

The good surgical practices concerning the CH in Algeria are not sufficiently respected, the insufficient use of the laparoscopy (77.9%), the systematic drainage of the peritoneal cavity, the antibiotic prophylaxis, and the duration of hospitalization are practices to be improved

The organization of continuing medical education sessions, and the establishment of an annual accreditation system ensures the ongoing professional development of practicing surgeons, publishing guidelines of best practices adapted to the socio-professional and economic contexts of Algeria are a necessity, those guidelines must be based on surveys and studies performed in Algeria or in countries with a similar professional and economic context. Our survey must be improved and repeated.

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