

LAPAROSCOPIC CHOLECYSTECTOMY

MODULE: GENERAL SURGERY

TARGET: CT1 – ST4 GENERAL SURGERY

BACKGROUND:

Laparoscopic cholecystectomy is one of the most commonly performed elective general surgical procedures in the UK. Laparoscopic surgery requires a slightly different skill set to that of open surgery and learning these skills – hand-eye co-ordination and depth perception provides some challenges for the junior surgeon.

Laparoscopic surgery places a greater dependence upon visual cues as haptic inputs are dampened through the long instruments and traction in the ports. This simulation allows the trainee to practice their laparoscopic skills as well as gain familiarity with the steps of laparoscopic cholecystectomy, the instruments and equipment that are used. The use of real tissues in this simulation allows trainees to develop their tissues handling skills.

RELEVANT AREAS OF THE CURRICULUM

Module 3: Basic surgical skills

Safe use of surgical diathermy

Handle tissues gently with appropriate instruments

Basics of surgical endoscopy

INFORMATION FOR FACULTY

This skills simulation is useful on a number of different levels and therefore may be useful for learners at different levels of seniority.

For the more junior trainee, the emphasis should be upon learning the steps of the surgical procedure, which instruments are inserted into which ports and gaining depth perception.

For the more senior trainee the emphasis should be upon creating appropriate counter-traction and identifying the correct plane for dissection – neither perforating the gallbladder nor damaging the liver bed.

LEARNING OBJECTIVES

In this skills simulation session learners will:

Revise the steps of laparoscopic cholecystectomy

Gain familiarity with the instruments and equipment

Have the opportunity to gain depth perception by manipulating tissues in a laparoscopic environment

Learn different diathermy techniques – hook and heel

Have the opportunity to practice using counter-traction to identify and develop the plane using real tissues.

SCENE SETTING

Location: Skills lab

(NB. Need LOW tables as box trainers increase the height of table working. Place the liver in the box trainer gallbladder facing downwards. Stick the diathermy plate onto the underside of the liver so that at least one quarter of the liver is in contact. Settings should be at 25 cutting 25 coagulation).

Learners will work in pairs – one as camera holder the other as primary surgeon. They will then swap over.

Expected duration of scenario: 45 mins per lap chole On-going faculty feedback

EQUIPMENT AND CONSUMABLES

Box trainer eg. Pharmabiotics BTS300 Body torso simulator £1,047 each PLUS

Laparoscopic stack system eg. Storz (gas insufflation not required) ability to video record footage is desirable

Alternatively - Annex Art Laparoscopic simulator system – includes box trainer, light source, camera – will also need video monitor

Scopes – either 30 degree or 0 degree 10mm scopes are suitable

Selection of laparoscopic ports – 2 x 12mm and 2 x 5mm

Selection of laparoscopic instruments – Endoclinch, Endograsp, Endodissect and Endoshears

Hook diathermy

Endoclipper

Finger-switch diathermy hand piece

ValleyLab diathermy machine – Force 2 (second hand auction price around £750)

ValleyLab diathermy plates E7506 POLYHESIVE NON REM RET EL £79.50 for 50

Inco pads

Porcine liver gallbladders – available from Fresh Tissue Supplies £6.50 each

Burt bag for gallbladder retrieval

Non-sterile gloves

Clinical waste bags for disposal at end

PARTICIPANT BRIEFING

Perform a laparoscopic cholecystectomy – due to differences between the porcine Calot's triangle and human biliary anatomy, it may not be possible to separately dissect out the cystic duct and artery as they are very small, therefore it is acceptable to take these structures together. Aim to place 3 clips across the structures and divide them leaving 2 clips on the side that will remain in the patient, then proceed to dissecting the gallbladder off the liver using the hook diathermy. Attempt to stay in the correct plane neither going into the liver bed nor perforating the gallbladder.

FACULTY BRIEFING

Please watch the learners during this skills session paying particular attention to usage of the hook diathermy – always keeping the hook within view. Also please pay particular attention to the counter-traction that the learners apply.

FREEZE-FRAME OF THE SIMULATED LAPAROSCOPIC CHOLECYSTECTOMY



SURGERY > TECHNICAL SCENARIO 3 > LAP CHOLE

INFORMATION FOR PARTICIPANTS

KEY POINTS

Insertion of gallbladder retractor through most lateral of ports.
Maintain lateral traction on Hartmann pouch to open up Calots triangle sufficiently for safe dissection
Keep hook within view at all times
Traction and counter-traction to assist with identifying the correct plane for dissection
Frequent adjustment of left hand grasper as the dissection progresses in order to maintain adequate tension.

RELEVANCE TO THE CURRICULUM

Principles of endoscopic surgery
Tissue handling
Safe use of diathermy

WORKPLACE-BASED ASSESSMENTS

There is a PBA Procedure Based Assessment via ISCP.

ADDITIONAL INFORMATION

General Surgery PBA: HPB: Laparoscopic cholecystectomy v2		
Trainee:	Assessor:	Date:
Assessor's Position*:	Email (institutional):	GMC No:
Duration of procedure (mins):	Duration of assessment period (mins):	Hospital:
Operation more difficult than usual? Yes / No (If yes, state reason)		<input type="checkbox"/> Tick this box if this PBA was performed in a Simulated setting .

* Assessors are normally consultants (senior trainees may be assessors depending upon their training level and the complexity of the procedure)

IMPORTANT: The trainee should explain what he/she intends to do throughout the procedure. The Assessor should provide verbal prompts if required, and intervene if patient safety is at risk.

Rating:

N = Not observed or not appropriate

D = Development required

S = Satisfactory standard for CCT (no prompting or intervention required)

Competencies and Definitions		Rating N/D/S	Comments
I. Consent			
C1	Demonstrates sound knowledge of indications and contraindications including alternatives to surgery		
C2	Demonstrates awareness of sequelae of operative or non operative management		
C3	Demonstrates sound knowledge of complications of surgery		
C4	Explains the perioperative process to the patient and/or relatives or carers and checks understanding		
C5	Explains likely outcome and time to recovery and checks understanding		
II. Pre operation planning			
PL1	Demonstrates recognition of anatomical and pathological abnormalities (and relevant comorbidities) and selects appropriate operative strategies / techniques to deal with these e.g. nutritional status		
PL2	Demonstrates ability to make reasoned choice of appropriate equipment, materials or devices (if any) taking into account appropriate investigations e.g. x-rays		
PL3	Checks materials, equipment and device requirements with operating room staff		
PL4	Ensures the operation site is marked where applicable		
PL5	Checks patient records, personally reviews investigations		
III. Pre operative preparation			
PR1	Checks in theatre that consent has been obtained		
PR2	Gives effective briefing to theatre team		
PR3	Ensures proper and safe positioning of the patient on the operating table		
PR4	Demonstrates careful skin preparation		
PR5	Demonstrates careful draping of the patient's operative field		
PR6	Ensures general equipment and materials are deployed safely (e.g. catheter, diathermy)		
PR7	Ensures appropriate drugs administered		
PR8	Arranges for and deploys specialist supporting equipment (e.g. image intensifiers) effectively		
IV. Exposure and closure			
E1	Demonstrates knowledge of optimum skin incision / portal / access		
E2	Achieves an adequate exposure through purposeful dissection in correct tissue planes and identifies all structures correctly		
E3	Completes a sound wound repair where appropriate		

E4	Protects the wound with dressings, splints and drains where appropriate		
V. Intra operative technique: global (G) and task-specific items (T)			
IT1(G)	Follows an agreed, logical sequence or protocol for the procedure		
IT2(G)	Consistently handles tissue well with minimal damage		
IT3(G)	Controls bleeding promptly by an appropriate method		
IT4(G)	Demonstrates a sound technique of knots and sutures/staples		
IT5(G)	Uses instruments appropriately and safely		
IT6(G)	Proceeds at appropriate pace with economy of movement		
IT7(G)	Anticipates and responds appropriately to variation e.g. anatomy		
IT8(G)	Deals calmly and effectively with unexpected events/complications		
IT9(G)	Uses assistant(s) to the best advantage at all times		
IT10(G)	Communicates clearly and consistently with the scrub team		
IT11(G)	Communicates clearly and consistently with the anaesthetist		
IT12(T)	Creates a pneumoperitoneum safely		
IT13(T)	Safely inserts an appropriate number of ports		
IT14(T)	Dissects cholecystectomy triangle safely		
IT15(T)	Safely ligates and divides cystic duct and cystic artery		
IT16(T)	Recognises the need for conversion		
IT17(T)	Recognises indications for operative cholangiogram		
IT18(T)	Performs operative cholangiogram safely and interprets radiological findings appropriately. If decides exploration of common bile duct indicated, proceed with steps IT19 - 23 below		
IT19(T)	Dissects supra-duodenal portion of common bile duct and place stay sutures between which choledochotomy performed		
IT20(T)	Irrigates common bile duct with catheter to wash out any stones		
IT21(T)	Visualises lumen of common bile duct with choledochoscope		
IT22(T)	Closes choledochotomy with or without T-tube		
IT23(T)	If uses a T-tube cuts limbs to appropriate length and performs post-insertion cholangiogram		
IT24(T)	Carefully mobilises gallbladder off the liver		
IT25(T)	Safely extracts gallbladder from a port site		
VI. Post operative management			
PM1	Ensures the patient is transferred safely from the operating table to bed		
PM2	Constructs a clear operation note		
PM3	Records clear and appropriate post operative instructions		
PM4	Deals with specimens. Labels and orientates specimens appropriately		

Global Summary

Level at which completed elements of the PBA were performed on this occasion		Tick as appropriate
Level 0	Insufficient evidence observed to support a summary judgement	
Level 1	Unable to perform the procedure, or part observed, under supervision	
Level 2	Able to perform the procedure, or part observed, under supervision	
Level 3	Able to perform the procedure with minimum supervision (needed occasional help)	
Level 4	Competant to perform the procedure unsupervised (could deal with complications that arose)	

Comments by Assessor (including strengths and areas for development):

Comments by Trainee:

DEBRIEFING

POINTS FOR FURTHER DISCUSSION

This simulation has established construct validity and skills may be assessed by trained expert raters using either OSATS tool or the CAT tool.

Variable	Rating				
	1	2	3	4	5
Respect for Tissue	N/A Often used unnecessary force on tissue or caused damaged by inappropriate use of instruments		Careful handling of tissue but occasionally caused inadvertent damage		Consistently handled tissues appropriately, with minimal damage
Time and Motion	N/A Many unnecessary moves		Efficient time and motion, but some unnecessary moves		Economy of movement and maximum efficiency
Instrument Handling	N/A Repeatedly makes tentative or awkward moves with instruments		Competent use of instruments, although occasionally appeared stiff or awkward		Fluid moves with instruments and no awkwardness
Knowledge of Instruments	N/A Frequently asked for the wrong instrument or used an inappropriate instrument		Knew the names of most instruments and used the appropriate instrument for the task		Obviously familiar with the required instruments and knew their names
Use of Assistants	N/A Consistently placed assistants poorly or failed to use assistants		Good use of assistants most of the time		Strategically used assistant to the best advantage at all times
Flow of operation and Forward Planning	N/A Frequently stopped operating or needed to discuss next move		Demonstrated ability for forward planning with steady progression of operative procedure		Obviously planned course of operation with effortless flow from one move to the next
Knowledge of Specific Procedure	N/A Deficient knowledge. Needed specific instruction at most operative steps		Knew all important aspects of the operation		Demonstrated familiarity with all aspects of the operation

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Competency Assessment Tool (CAT) for Laparoscopic Cholecystectomy

Date:/...../..... Participant code number: Assessor.....

TASK	INSTRUMENT USE		TISSUE HANDLING		NEAR MISSES AND ERRORS		END-PRODUCT QUALITY	
EXPOSURE Adequate exposure of cystic artery and cystic duct	Insertion of ports:		Incision of peritoneum at Calot's triangle		This task was performed with:		Were the cystic artery and duct identified?	
	<input type="checkbox"/> Hazardous	Dangerous technique (not visualised), hazardous or wrong position	<input type="checkbox"/> Uncoordinated	Stiff and uncontrolled movements, overshooting	<input type="checkbox"/> Damage	Macroscopic perforation, burn or grasp marks, bleed	<input type="checkbox"/> No	Anatomical structures insufficiently identified
	<input type="checkbox"/> Inadequate	Incompetent (several attempts) or ergonomically poor position	<input type="checkbox"/> Hesitant	Controlled movements, but hesitant and inefficient.	<input type="checkbox"/> Near miss(es)	Bloody dissection, too close to sensitive structures	<input type="checkbox"/> Vaguely	Main structures identified, wrong plane, covered by tissue
	<input type="checkbox"/> Safe	Safe insertion and ergonomically good position	<input type="checkbox"/> Skilful	Smooth, controlled and meaningful movements.	<input type="checkbox"/> No damage	No damage to bowel, major blood vessels	<input type="checkbox"/> Yes	Main structures identified
	<input type="checkbox"/> Masterly	Masterful insertion, ideal positioning	<input type="checkbox"/> Versatile	Masterful instrument use, effective movements.	<input type="checkbox"/> Tissue-protective	Performed with best possible tissue protection	<input type="checkbox"/> Anatomical	Crystal clear demonstration of anatomy
	<input checked="" type="checkbox"/> N/A	Not applicable	<input checked="" type="checkbox"/> N/A		<input checked="" type="checkbox"/> N/A		<input checked="" type="checkbox"/> N/A	
CALOT'S TRIANGLE DISSECTION Safe dissection of cystic artery and duct	Use of haemostatic tool (clip applier/ diathermy/ stapler):		Dissection of artery and duct:		This task was performed with:		How was the management of the cystic pedicle?	
	<input type="checkbox"/> Hazardous	Insufficient view, uncontrolled movements	<input type="checkbox"/> Hazardous	Insufficient view, uncontrolled movements	<input type="checkbox"/> Damage	Macroscopic perforation, burn or grasp marks, bleed	<input type="checkbox"/> Uncontrolled	Duct/ artery not secured or leakage/ bleeding
	<input type="checkbox"/> Laborious	Awkward and repeated unnecessary attempts	<input type="checkbox"/> Inefficient	Several, hesitant cuts	<input type="checkbox"/> Near miss(es)	Bloody dissection, too close to sensitive structures	<input type="checkbox"/> Imprecise	Duct/ artery not accurately secured before dissection
	<input type="checkbox"/> Efficient	Instrument accurately placed and engaged	<input type="checkbox"/> Safe	Safe dissection under view	<input type="checkbox"/> No damage	No damage to bowel, blood vessels or biliary system	<input type="checkbox"/> Safe	Duct/artery safely secured before dissection
	<input type="checkbox"/> Masterly	Highly efficient and safe use of instrument	<input type="checkbox"/> Efficient	Smooth and efficient dissection	<input type="checkbox"/> Tissue-protective	Performed with best possible tissue protection	<input type="checkbox"/> Flawless	Duct/artery perfectly secured before dissection
	<input checked="" type="checkbox"/> N/A		<input checked="" type="checkbox"/> N/A		<input checked="" type="checkbox"/> N/A		<input checked="" type="checkbox"/> N/A	
RESECTION Safe removal of gallbladder in correct plane between GB and liver	Use of graspers/ dissection tools:		Use of non-dominant hand (NDH):		This task was performed with:		Was the gallbladder safely removed from the liver bed?	
	<input type="checkbox"/> Uncoordinated	Stiff and uncontrolled movements, overshooting	<input type="checkbox"/> Stagnant	NDH does not move	<input type="checkbox"/> Damage	Macroscopic perforation, burn or grasp marks, bleed	<input type="checkbox"/> Wrong plane	Resulted in biliary spillage, wrong tissue plane
	<input type="checkbox"/> Hesitant	Controlled movements, but hesitant and inefficient.	<input type="checkbox"/> Lagging	NDH is adjusting with delay or without efficiency	<input type="checkbox"/> Near miss(es)	Bloody dissection, too close to sensitive structures	<input type="checkbox"/> Inconsistent	Not consistently in correct plane, minor spillage
	<input type="checkbox"/> Skilful	Smooth, controlled and meaningful movements.	<input type="checkbox"/> Meaningful	Meaningful adjustment of NDH to improve exposure	<input type="checkbox"/> No damage	No damage to bowel, blood vessels or biliary system	<input type="checkbox"/> Satisfactory	Correct plane
	<input type="checkbox"/> Versatile	Masterful instrument use, effective movements.	<input type="checkbox"/> Forward planning	Strategic and intelligent adjustments by NDH	<input type="checkbox"/> Tissue-protective	Performed with best possible tissue protection	<input type="checkbox"/> Ideal	Correct plane, highly efficient
	<input checked="" type="checkbox"/> N/A		<input checked="" type="checkbox"/> N/A		<input checked="" type="checkbox"/> N/A		<input checked="" type="checkbox"/> N/A	

PARTICIPANT REFLECTION

What have you learned from this experience? (Please try and list 3 things)

How will you be able to put into practice what you have learned?

Which skills were your particular strengths?

Which were your weaker skills where you need further practice?

PARTICIPANT FEEDBACK

Date of training session:.....

Learner Grade:.....

	Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
I found this simulation useful					
I understand more about the simulation subject					
I have more confidence to deal with this condition					
The material covered was relevant to me					

Please write down one thing you have learned today, and that you will use in your clinical practice.

How could this scenario be improved for future participants? This is especially important if you have ticked anything in the disagree/strongly disagree box.

FACULTY DEBRIEF – TO BE COMPLETED BY FACULTY TEAM

What went particularly well during this skills simulation?

What did not go well, or as well as planned?

Why didn't it go well?

How could the skills simulation be improved for future participants?