

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.

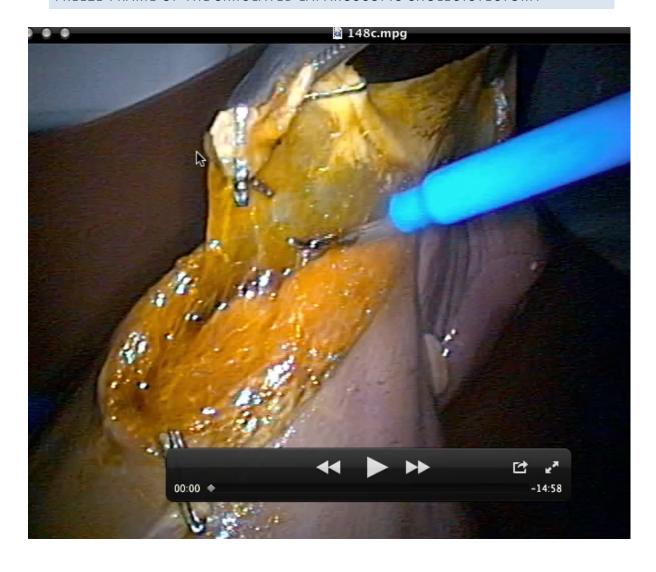




FACULTY BRIEFING

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 countertraction 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: Lap	paroscopic chol	ecystectomy 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 / N reason)	lo (If yes, state	[] Tick this box if this setting.	PBA was performed in a Simulated

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. Conse	ent		
C1	Demonstrates sound knowledge of indications and contraindications including alternatives to surgery		
C2	Demonstrates awareness of sequelae of operative or non operative management		
С3	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 o	peration 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	pperative 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. Expo	osure 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		



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



V. Intra operative technique: global (G) and task-specific items (T) Follows an agreed, logical sequence or protocol for the procedure Follows an agreed, logical sequence or protocol for the procedure Follows an agreed, logical sequence or protocol for the procedure Follows an agreed, logical sequence or protocol for the procedure Follows an agreed, logical sequence or protocol for the procedure Follows and surverse			
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ITT9(T) between which choledocnotomy 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	IT18(T)	appropriately. If decides exploration of common bile duct indicated, proceed	
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	IT19(T)		
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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	IT21(T)	Visualises lumen of common bile duct with choledochoscope	
IT24(T) 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	IT22(T)	Closes choledochotomy with or without T-tube	
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	IT23(T)		
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	IT24(T)	Carefully mobilises gallbladder off the liver	
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	IT25(T)	Safely extracts gallbladder from a port site	
PM2 Constructs a clear operation note PM3 Records clear and appropriate post operative instructions	VI. Post	operative management	
PM3 Records clear and appropriate post operative instructions	PM1	Ensures the patient is transferred safely from the operating table to bed	
	PM2	Constructs a clear operation note	
DM4 Deels with angimons. Labels and grientetes angimons appropriately	РМ3	Records clear and appropriate post operative instructions	
Pivi4 Deals with specimens, Labels and orientates specimens appropriately	PM4	Deals with specimens. Labels and orientates specimens appropriately	

Global Summary

Level at v	Level at which completed elements of the PBA were performed on this occasion			
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
		1	2	3	4	5
Time and Motion	N/A	Many unnecessary moves		Efficient time and motion, but some unnecessary moves		Economy of movement and maximum efficiency
		1	2	3	4	5
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
		1	2	3	4	5
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
		1	2	3	4	5
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
		1	2	3	4	5
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
		1	2	3	4	5
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

Acknowledgements to London Deanery Skills program - Miskovic D, Mavroveli S, Mater N, Hanna G





U	CAT
Competen	cy Assessment Tool by Imperial College London

Competency Assessment Tool (CAT) for Laparoscopic Cholecystectomy

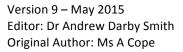
Date://	Participant code number:	. Assessor
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TASK	INST	RUMENT USE	TISS	UE HANDLING	NEAR MISS	SES AND ERRORS	END-PRODUCT QUALITY		
	Inse	rtion of ports:	Incision of peritoneum at Calot's triangle		This task w	as performed with:	Were the cystic artery and duct identified?		
EXPOSURE Adequate exposure of cystic artery and cystic duct	₁ Hazardous	Dangerous technique (not visualised), hazardous or wrong position	₁□ Uncoordinated	Stiff and uncontrolled movements, overshooting	₁☐ Damage	Macroscopic perforation, burn or grasp marks, bleed	₁□ No	Anatomical structures insufficiently identified	
	2 Inadequate	Incompetent (several attempts) or ergonomically poor position	₂☐ Hesitant	Controlled movements, but hesitant and inefficient.	2 Near miss(es)	Bloody dissection, too close to sensitive structures	₂□ Vaguely	Main structures identified, wrong plane, covered by tissue	
EXPC late exp	₃_ Safe	Safe insertion and ergonomically good position	₃ Skilful	Smooth, controlled and meaningful movements.	₃ No damage	No damage to bowel, major blood vessels	₃□ Yes	Main structures identified	
Adequ	₄ Masterly	Masterful insertion, ideal positioning	₄ Versatile	Masterful instrument use, effective movements.	₄☐ Tissue- protective	Performed with best possible tissue protection	₄□ Anatomical	Crystal clear demonstration of anatomy	
	x□ N/A	Not applicable	_x □ N/A		x□ N/A	-	x□ N/A		
and	Use of haemos diathe	static tool (clip applier/ ermy/ stapler):	Dissection	of artery and duct:	This task w	as performed with:	How was the	e management of the cystic pedicle?	
SSEC	- Hazardous	Insufficient view, uncontrolled movements	₁☐ Hazardous	Insufficient view, uncontrolled movements	₁☐ Damage	Macroscopic perforation, burn or grasp marks, bleed	Uncontrolled	Duct/ artery not secured or leakage/ bleeding	
NGLE DIS of cystic a	2 Laborious	Awkward and repeated unnecessary attempts	₂☐ Inefficient	Several, hesitant cuts	2 Near miss(es)	Bloody dissection, too close to sensitive structures	₂ Imprecise	Duct/ artery not accurately secured before dissection	
CALOT'S TRIANGLE Safe dissection of cys	₃ Efficient	Instrument accurately placed and engaged	₃□ Safe	Safe dissection under view	₃ No damage	No damage to bowel, blood vessels or biliary system	₃ Safe	Duct/artery safely secured before dissection	
	₄ Masterly	Highly efficient and safe use of instrument	₄ Efficient	Smooth and efficient dissection	Tissue- protective	Performed with best possible tissue protection	₄ Flawless	Duct/artery perfectly secured before dissection	
0	x□ N/A		x□ N/A		x□ N/A		x N/A		
correct	Use of graspers/ dissection tools:		Use of non-c	lominant hand (NDH):	This task wa	as performed with:	Was the gallbladder safely removed from liver bed?		
r d in co	₁ Uncoordinated	Stiff and uncontrolled movements, overshooting	₁☐ Stagnant	NDH does not move	₁☐ Damage	Macroscopic perforation, burn or grasp marks, bleed	₁☐ Wrong plane	Resulted in biliary spillage, wrong tissue plane	
RESECTION Safe removal of galibladder d in corplane between GB and liver	₂_ Hesitant	Controlled movements, but hesitant and inefficient.	₂ Lagging	NDH is adjusting with delay or without efficiency	2 Near miss(es)	Bloody dissection, too close to sensitive structures	Inconsistent	Not consistently in correct plane, minor spillage	
	₃□ Skillful	Smooth, controlled and meaningful movements.	₃ Meaningful	Meaningful adjustment of NDH to improve exposure	₃ No damage	No damage to bowel, blood vessels or biliary system	₃ Satisfactory	Correct plane	
	₄ Versatile	Masterful instrument use, effective movements.	Forward planning	Strategic and intelligent adjustments by NDH	Tissue- protective	Performed with best possible tissue protection	₄ ☐ Ideal	Correct plane, highly efficient	
	x□ N/A		x□ N/A		x□ N/A		x□N/A		



PARTICIPANT REFLECTION

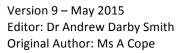
M -	
What have you learned from this experience? (Please try and list 3 things)	
low will you be able to put into practice what you have learned?	
Which skills were your particular strengths?	
Which were your weaker skills where you need further practice?	







Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
u have learned t	today, and that	; you will use in you	ır clinical practio	ce.
roved for future ly disagree box.	participants? ⁻	Γhis is especially im	portant if you h	nave ticked
	Strongly Agree u have learned t	Strongly Agree Agree u have learned today, and that	Strongly Agree Neither agree nor disagree Agree nor disagree u have learned today, and that you will use in you	Strongly Agree Neither agree Disagree nor disagree Agree nor disagree u have learned today, and that you will use in your clinical practice roved for future participants? This is especially important if you h







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?

