

# VASCULAR ANASTOMOSES

## MODULE: GENERAL SURGERY

## TARGET: CT1 – ST4

## BACKGROUND:

Vascular surgery poses very particular technical challenges to the junior surgeon. Firstly the suture material utilised is frequently prolene requiring absolute security of knots due to its memory, the diameter of the suture material is very fine requiring precise positioning and control with exact placement of sutures to avoid bleeding from an anastomotic line. Tissue handling is also very important to avoid dislodging atheromatous plaque from the wall of the artery into the lumen causing embolisation. This skills simulation focuses specifically upon continuous suturing for vascular anastomoses.

## RELEVANT AREAS OF THE CURRICULUM

The ISCP states that by the end of CT2 the trainee should be a safe and useful assistant in the operating room and be able to perform some simple procedures under minimal supervision and perform more complex procedures under direct supervision.

### Module 3: Basic surgical skills

- To handle surgical instruments safely
- To handle tissues safely
- To tie secure knots
- To achieve haemostasis of superficial vessels
- To assist helpfully, even when the operation is not familiar
- Suture ligation
- Principles of anastomosis

## INFORMATION FOR FACULTY

### LEARNING OBJECTIVES

- To practice fine motor skills with reference to vascular suturing
- To perform a continuous suture maintaining tension along it
- To tie secure knots with prolene
- To practice tissue handling

### SCENE SETTING

- |                                |  |
|--------------------------------|--|
| Location:                      | Bench-top laboratory setting                                 |
| Expected duration of scenario: | 45 mins with ongoing technical feedback throughout procedure |

## EQUIPMENT AND CONSUMABLES

Non sterile gloves  
Inco pad / sheet  
Number 11 scalpel blade  
Scalpel handle No. 3  
Sharps bin  
Kidney dish  
Travers retractor x2  
Debakey forceps  
Potts scissors  
Selection of arterial clamps  
2 x Mosquito clips with 'rubber shods'  
4/0 double ended Prolene suture x2  
Straight Mayo scissors  
Vascular jig Part 60670 Limbs and Things £19 each and  
8m x 140 'artery' Limbs and Things Part 60665 £27 for 6  
OR alternatively can use porcine aorta from Fresh Tissue Supplies £3.20 each need drawing pins and cork boards to anchor this down  
PTFE reinforced graft material OR 'vein' 6 x 140mm Part 60661 from Limbs and Things £19 for 6

## PARTICIPANT BRIEFING

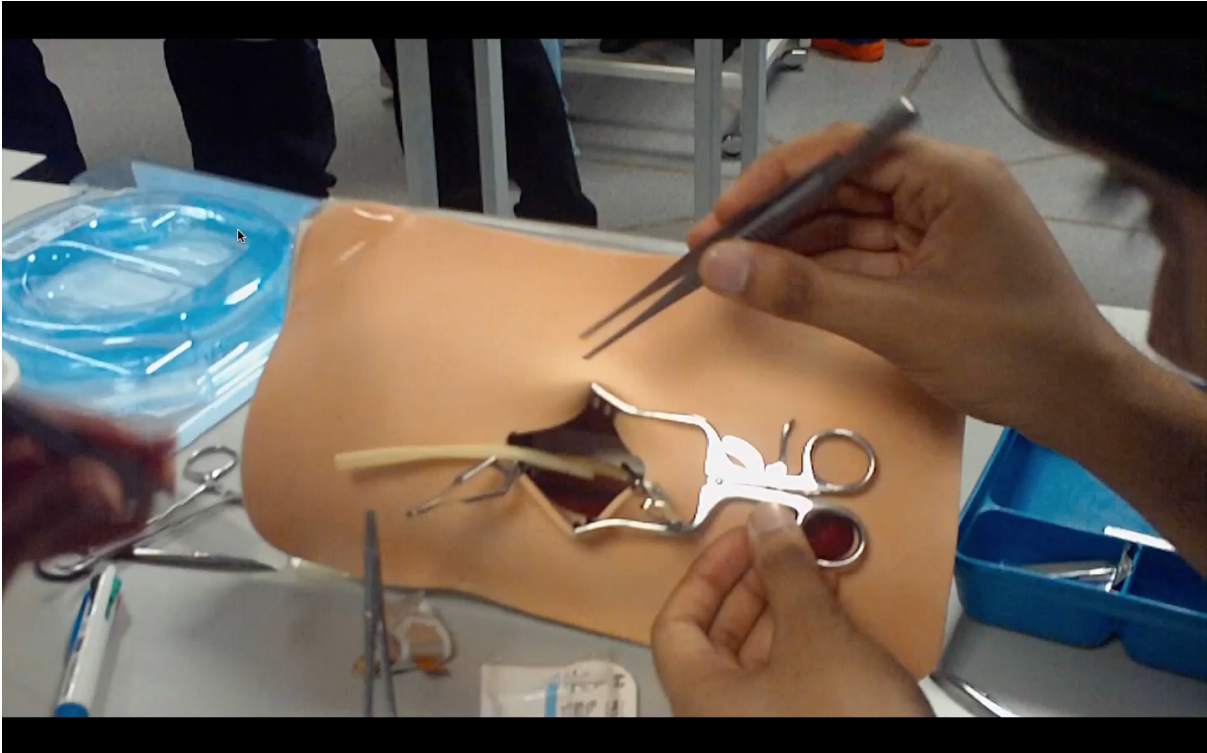
Task 1: Create an arteriotomy and sew a vein patch onto this to widen the vessel.

Task 2: Using the materials provided either perform the top end of a fem-pop bypass graft using PTFE reinforced graft or 'vein'.

## FACULTY BRIEFING

Please describe how to parachute the graft material onto the artery and why this is performed.  
Explain the importance of in to out on the artery.

## ADDITIONAL INFORMATION



The purpose of this simulation is to train generic techniques – continuous suturing and the ability to assist helpfully.

## DEBRIEFING

## POINTS FOR FURTHER DISCUSSION

Pay attention to knot tying technique with prolene – are all of the knots secure? How many throws?  
Maintaining tension along continuous suture – work with your assistant  
Ergonomics and pronation / supination when suturing

## DEBRIEFING RESOURCES

May choose to use video footage to aid debriefing

**SURGERY > TECHNICAL SCENARIOS > VASCULAR****INFORMATION FOR PARTICIPANTS****KEY POINTS**

Unbraided sutures need more throws aim for 7 with prolene  
Security and construction of knots particularly important with prolene  
Ergonomics of suturing  
Pronation / supination  
Maintenance of tension along a continuous suture line is key

**RELEVANCE TO THE CURRICULUM****Module 3 Basic surgical skills**

Safe administration of appropriate local anaesthetic agents.  
Acquisition of basic surgical skills in instrument and tissue handling.  
Incise superficial tissues accurately with suitable instruments.  
Close superficial tissues accurately.  
Tie secure knots.  
Achieve haemostasis of superficial vessels.  
Use suitable methods of retraction.  
Handle tissues gently with appropriate instruments.  
Assist helpfully, even when the operation is not familiar.

**Specific curricular items related to inguinal hernia**

Anatomy of inguinal region including inguinal canal  
Hernia repair-inguinal

**WORKPLACE-BASED ASSESSMENTS**

There is a PBA for vascular anastomosis on the ISCP that may be used in a modified form during this simulation exercise for purely the technical aspects of the proximal anastomosis.

**ADDITIONAL INFORMATION**

<b>General Surgery PBA: VASCULAR - Infra-inguinal bypass v2 (1. BASIC: Femoropopliteal bypass - AK)</b>		
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 <b>Simulated setting</b> .

\* 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
<b>I. Consent</b>			
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 procedure to the patient / relatives / carers and checks understanding		
C5	Explains likely outcome and time to recovery and checks understanding		
<b>II. Pre operation planning</b>			
PL1	Demonstrates recognition of anatomical and pathological abnormalities (and relevant co-morbidities) and selects appropriate operative strategies / techniques to deal with these		
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 (including vein if used)		
PL5	Checks patient records, and ensures that all investigations including images are available		
<b>III. Pre operative preparation</b>			
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 e.g. prophylactic antibiotics		
PR8	Arranges for and deploys specialist equipment (e.g. image intensifier) effectively		
<b>IV. Exposure and closure</b>			
E1	Demonstrates knowledge of optimum skin incisions and 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		
<b>V. Intra operative technique: global (G) and task-specific items (T)</b>			
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 e.g. heparin		
-	PROXIMAL ANASTOMOSIS		
IT12(T)	Displays and controls inflow vessel and confirms inflow site		
IT13(T)	Makes suitable arteriotomy at selected inflow site		
IT14(T)	Confirms good inflow and performs endarterectomy or extends arteriotomy if required		
IT15(T)	Performs anastomosis with sound eversion technique		
IT16(T)	Ensures there is no narrowing or distortion of vessels on completion of anastomosis		
-	LSV HARVEST (CAN APPLY TO HARVEST OF OTHER VEINS AND/OR TUNNELLING)		
IT17(T)	Dissects proximal end of LSV and detaches it cleanly from femoral vein		
IT18(T)	Closes femoral vein without bleeding or narrowing		
IT19(T)	Harvests LSV without damage, ligates branches securely and doesn't undermine skin		
IT20(T)	Tunnels graft without damage to surrounding structures and without twisting or kinking		
IT21(T)	Disrupts venous valves without damage to vein wall, tributaries or proximal anastomosis		
-	DISTAL ANASTOMOSIS		
IT22(T)	Displays and controls outflow vessel and confirms outflow site		
IT23(T)	Makes suitable arteriotomy at selected outflow site		
IT24(T)	Confirms good outflow and performs endarterectomy or extends arteriotomy if required		
IT25(T)	Performs anastomosis with sound eversion technique, using loupes if required		
IT26(T)	Ensures there is no narrowing or distortion of vessels on completion of anastomosis		
IT27(T)	Carries out quality check on graft function (e.g. duplex, flow measurement, arteriogram)		
<b>VI. Post operative management</b>			
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	(Not applicable to the procedure)		

### 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	



## PARTICIPANT REFLECTION

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

How will your practice now change?

What other actions will you now take to meet any identified learning needs?



**PARTICIPANT FEEDBACK**

Date of training session:.....

Learner grade:.....

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

How could this simulation 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 simulation?

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

Why didn't it go well?

How could the simulation be improved for future participants?