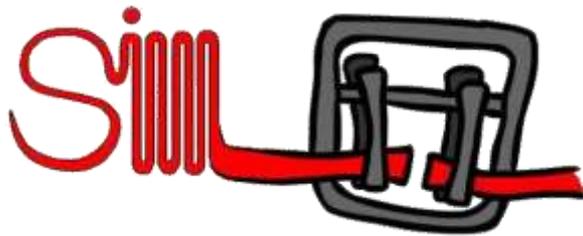
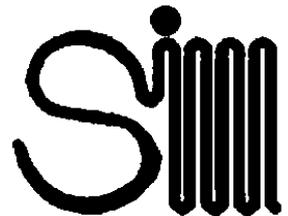


# STANDARDIZATION OF BASIC MICROCOURSES OF THE ITALIAN SOCIETY FOR MICROSURGERY

## THE FIRST TEN HOURS



COMMISSIONE FORMAZIONE  
SIM



Società Italiana di Microchirurgia - Presidente Pierluigi Tos

 SOCIETA' ITALIANA DI MICROCHIRURGIA   
26 - 28 Novembre 2015, TORINO  
XXVI CONGRESSO della  
SOCIETA' ITALIANA DI MICROCHIRURGIA

[Home](#) [Attualità](#) [In società](#) [Impres. e iniziative](#) [Gruppi di studio](#) [Commissioni](#) [Corsi e congressi](#) [Fotografia e video](#) [Informazioni pubblici](#) [Chi siamo](#)

- Formazione**
- CORSO BASE MICROCHIRURGIA**
  - CORSO AVANZATO MICROCHIRURGIA
  - CORSO LEMBI SU MODELLO VIVENTE
  - CORSO DI DIGESTIONE CHIRURGICA
  - FELLOWSHIP CLINICA ITALIANA IN MICROCHIRURGIA

**Corso Base di Microchirurgia 2015**



**CORSI ACCREDITATI SIM**



- Corsi Base Microchirurgia**
- CORSO BASE MICROCHIRURGIA
  - ACCREDITAMENTO SIM
  - FELLOWSHIP CLINICA ITALIANA IN MICROCHIRURGIA

[www.microchirurgia.org](http://www.microchirurgia.org)

# ITALIAN SOCIETY FOR MICROSURGERY

## Basic microsurgical courses standardization

### THE CONTEXT

**6-8 BASIC COURSES IN ITALY,**

with different way to teach, different evaluation methods, different number of hours, ..... , **only two** with a final **OBJECTIVE ASSESSMENT OF THE COMPETENCY**

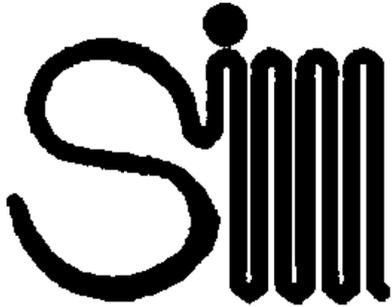
**1 advanced COURSE – 120 hrs – SIM**

**Rules for the admission :**

**basic course, 30 min suture of a 1 mm tube**

# ITALIAN SOCIETY FOR MICROSURGERY

## Basic microsurgical course standardization



**11 centers**

**University and Hospital**

### COMMISSION

#### STANDARDIZZAZIONE CORSI BASE

Coordinator - Roberto Baraziol

E Fraccalanza - **Udine**

B Panero, A Crosio - **Torino**

L Moccia, A Soldati - **Napoli**

M Riccio, P Pangrazi - **Ancona**

F Boriani - **Bologna**

E Cigna - **Roma**

A Occhini - **Pavia**

A Poggetti - **Pisa**

A Pedrazzini - **Parma**

S D'Arpa - F Toia - **Palermo**

M Baronetti - **Bari**

# **AIM of the COMMISSION**

## **MINIMUM STANDARD FOR THE ACCREDITATION OF THE COURSES**

**TEACHING PROGRESSION OF FIRST 10 Hours**

**METHODS OF ASSESSMENT OF THE FINAL  
COMPETENCY**

**OUR FIRST INTENT IS TO COMPLETELY PREPARE THE  
STUDENTS TO WORK ON LIVING MODELS (E.G. RAT)  
CAREFULLY AND EASILY IN ORDER TO RESPECT 3R**

# **GENERAL RULES FOR BASIC COURSES**

**1 microscope each student**

**20 hours practical course.**

**Microsurgical instrument: 2 forceps, 1 needle holder, 1 micro scissor, 1 approximator, 8-0/9-0 sutures.**

**First 10 hours on ex vivo models**

**1 tutor each 3 attendants**

# GENERAL RULES FOR BASIC COURSES

## FRONTAL LESSONS

Before practical sessions, frontal theoretical lessons will be performed. They will be about optical principles, instrumentations, sutures, ergonomics, how to give a stitch, how to perform vascular and nerve suture, basics techniques.

**The final evaluation method will be presented and all steps of GRS will be introduced.**



Queen Mary University London Microsurgery Global Rating Scale QMUL Micro GRS

Name/ID:	Setting			Clinical/Expert assess/Institution:	Model	Standardized Rat (Other (Specify))		Score
	Component	Procedure	Five Likert score '1' if there are any of the following errors observed during the procedure			1	2	
Preparation of operative field	D1	Preparation of operative field	Proximal drapes that span the field but leave the procedure site (distal or lateral) view with no background	loss of central view, inappropriately placed background		Or full prepared for procedure, uses background but fails to re- organize operative field through procedure (eg do not drape but panels of suture)		continuous organization and optimization of operative field
	D2	Instrument holding and lateral tension	Persistent Tension	Control use of instruments, but lateral tension		Control holding of instruments but underlying tension with occasional tension		Control and timely holding of instruments with the tension
Dexterity?	D3	Number of attempts to pick up the needle	Chosen needle is held and unable to pick up needle after 5 attempts	3 attempts		2-4 attempts		1st attempt
	D4	Technique to pick up and insert needle	pick needle up with fingers OR handles needle with two instruments at the same time	Chosen needle is held attempting to pick it up directly or flick 10 attempts to pick and insert needle		Manages to pick up the needle from suture and inserts it in donor hand instrument in 2-4 attempts		Picks needle up indirectly with suture and/or dominant hand then inserts it in the dominant hand instrument in 1 attempt
	D5	Needle to Needle holder angle (Medial Plane)	inserted positioning of needle with needle pointing downwards in line of intended track	Unable to position needle correctly (the needle is either up or side), or in correct position in 1st attempt		Positions needle correctly in 2-4 attempts OR needle pointing upwards in line of intended track		Positions needle in middle third in 1st attempt with needle pointing horizontally in line of intended track
Instrument Handling	D6	Needle to Needle holder angle (lateral plane)	Unable to position needle correctly or in 10 attempts (angle too acute or too obtuse)	positions needle correctly after 10 attempts		Positions needle correctly in 2-4 attempts		needle lies comfortably at right angles to the jaw of the needle holders in 1 attempt
	D7	Angle of needle to tissue	Unable to maintain angle, drops needle or pushes strongly through vessel wall	Frequently too acute or too flat		Occasionally too acute or too flat		Always passes needle perpendicular through the vessel wall
Needle Handling	D8	Driving needle through vessel wall	Attempts carried out without use of counter pressure	1 or more attempts / occasional use of counter pressure		2-4 attempts / appropriate use of counter pressure		1st attempt with appropriate use of counter pressure
	D9	Driving needle through vessel wall	Can't break through vessel wall	Fails need through in a straight line or a following suture OR pulls before permanently inserted		Follows needle correctly BUT with failure through without use of polypropylene pressure		Follows needle correctly AND pulls suture parallel to vessel wall while using the other hand restrained as a polypropylene pressure
	D10	Needle damage	Breaks by or inside	Sharp needle tip		needle bent or flattened		No damage AND no grasp of needle by suture
Tissue Handling	D11	Handling of Vessel	Tears vessel wall during suturing or stripping suture	Attempts to handle tissue with care BUT grabs vessel edges		Fails to clear adventitia OR any adventitia beyond 1st needle breakers		GOOD for going under edge at all, any handle edge first time, stay width or avoid adventitia
	D12	Tissue Bite	Vessel distortion as a result of unequal tissue bites on opposing edges AND between bites	Unequal tissue bites or opposing edges AND between bites, without vessel distortion		Occasionally takes too wide or too small a bite or opposing edges, OR unequal squares between bites		Perfect bites: 2-3 times of the needle thickness on both opposing edges WITH even spaces between bites
Suture Handling	D13	Suture damage	Breaks suture	Small suture		Flattened points of suturing of suture ends		No damage
	D14	Make a loop in 4 steps: "Think, loop, pick, suture"	Does not clear field of access suture loops reinserted staying at top off by of instrument	Loop or free-edge in too long OR too short OR suture knot lying OR entangled and struggling with surface tension		Starts from a prepared field with optimum suture position but fails to make a loop in 4 pick moves		Clear field, optimum position, successful loop in 4 pick moves
operative Flow	D15	Knots tension and spacing	NEITHER squares knots and loose knots	Frequently loose, not square knots, OR knots too loose or too tight		Squares knots BUT pulls apart perpendicular to vessel direction		All knots square, pull suture flat in pedicle tension with symmetrical edges
	D16	Use of magnification	Does not use different magnification	Occasionally uses different magnification		Uses variable magnification inappropriately OR limits to previews in one magnification power for both needle-position and knot tying		Always uses higher magnification for needle and tissue handling and lower magnification for handle suture and make knot
	D17	Operative Flow	Unable to complete task OR too long pauses between steps with frequent assessments OR no check for back wall sutures	Compares procedure but very slowly		Does not stop AND checks for back wall catching BUT proceed in other usual steps or slower than ideal pace		Does not stop, clearly familiar with steps AND always check of back wall suturing
Quality of end product	D18	Total Time for anastomosis (up to 10 minutes)	>10 min	10-15 min		21 - 30 min		4-20 min
	D19	Quality of anastomosis	Unacceptable suture are too loose, causing small OR obvious tears and tissue damage OR significant vessel distortion	Flow (showing suture) clearly obvious but no vessel distortion		Acceptable: suture are spaced evenly BUT are not entirely not parallel to vessel or slit through lumen)		superior suture are equally spaced with suture cut flat and at appropriate length, vessel edges perfectly apposed with no distortion
	D20	Patency	No patent OR obvious back wall OR Clap					Patent
<p>* The scores for D18 is dependent on D20. If the vessel is not patent, both D18 and D20 are automatically 0</p>								
Biological models								Total Score

# Queen Mary Uni Barts Modified Global Rating Score



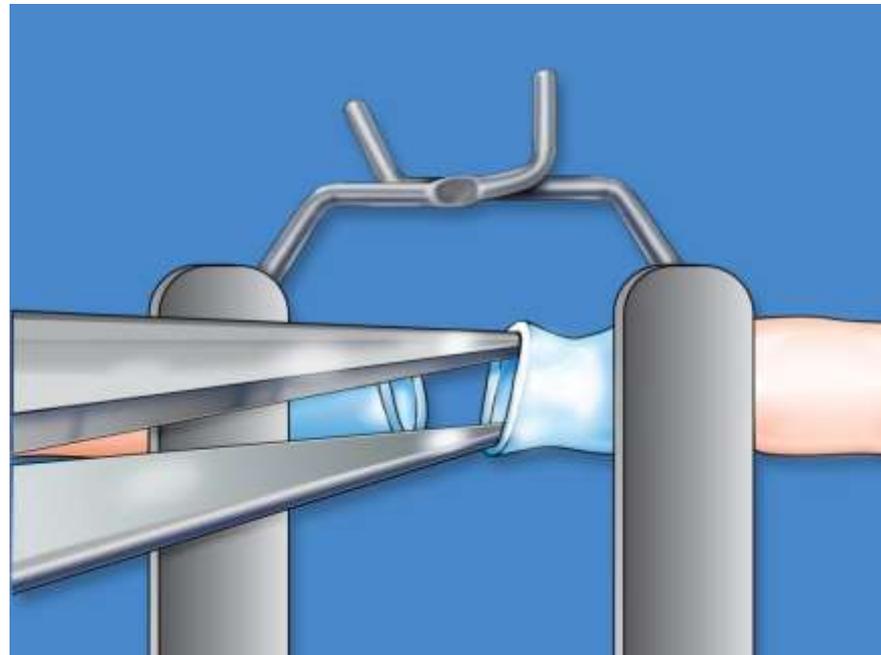
20 components  
18 + 2 for living models

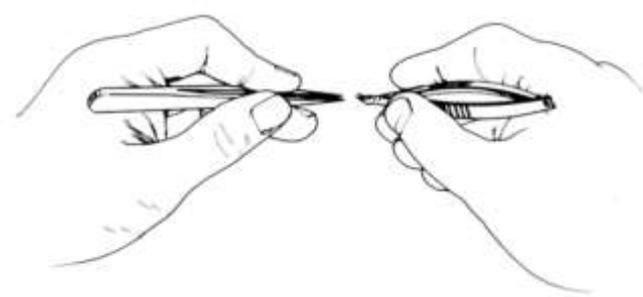
**Preparation of  
operative field**

**S1**

**Preparation of operative  
field**

**Proceeds despite that  
operative field not  
ready for procedure,  
obstructed or blurred  
view with no  
background**





S2

Instrument holding and hand tremor

S3

Technique to pick up and mount needle

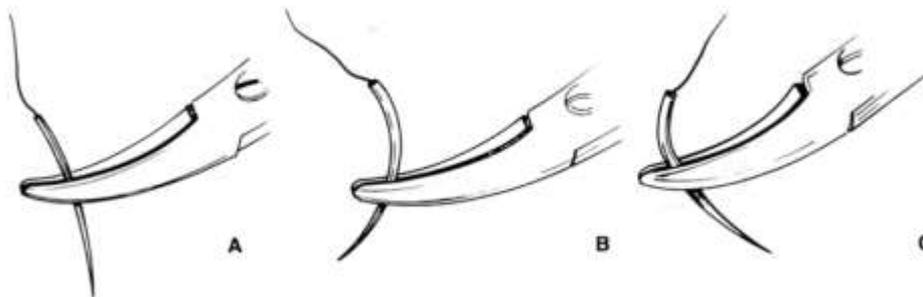


Dexterity / Instrument Handling



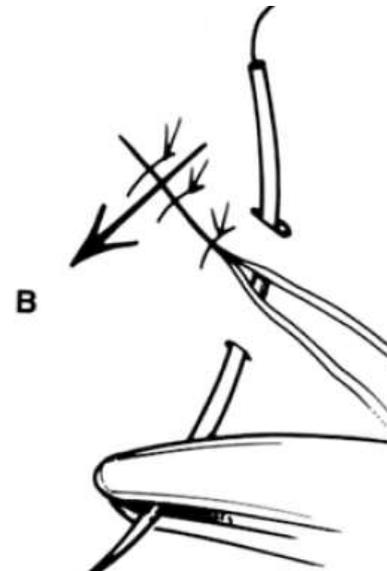
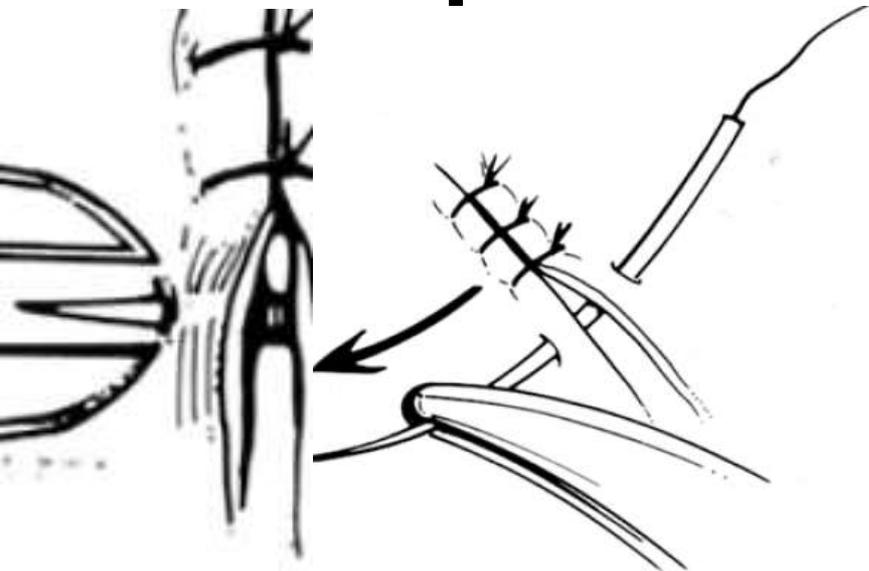
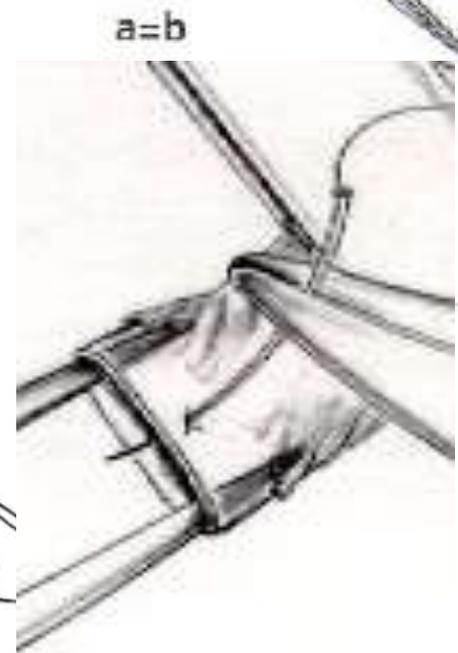
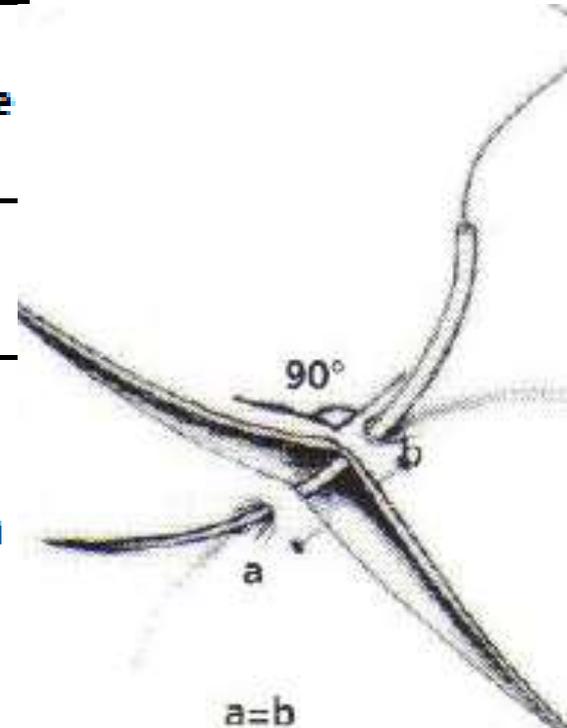
S4

Needle to Needle holder angle (Vertical Plane) AND Needle to Needle holder angle (Horizontal plane)



## Needle Handling

S5	Angle of needle to tissue
S6	Driving needle through vessel wall
S7	Guiding needle through vessel wall
S8	Needle damage



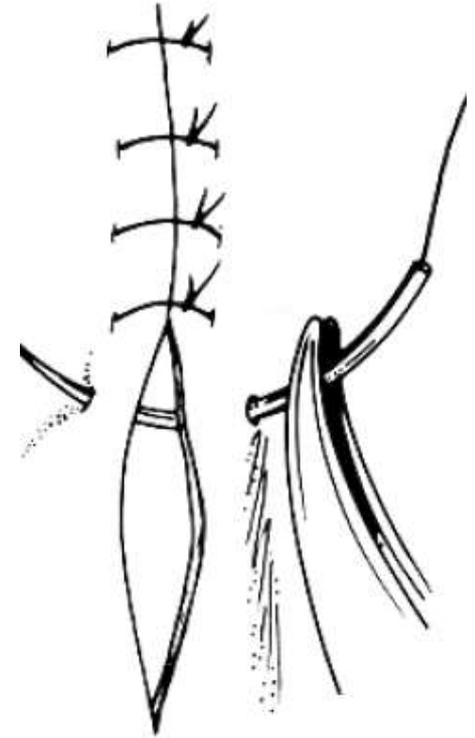
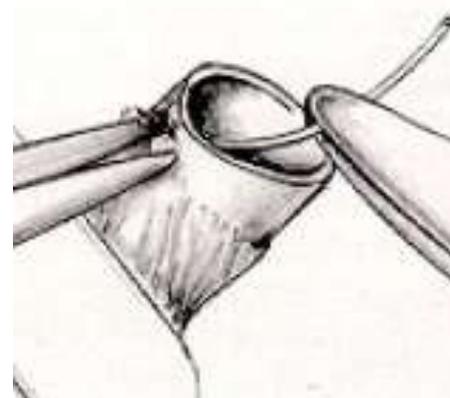
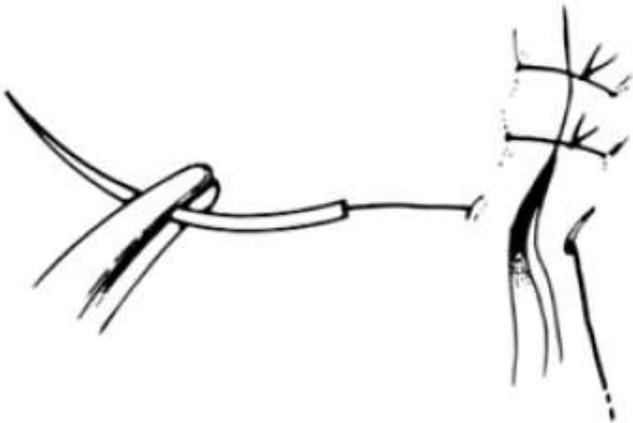
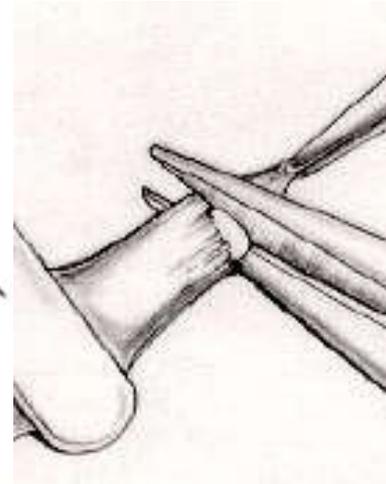
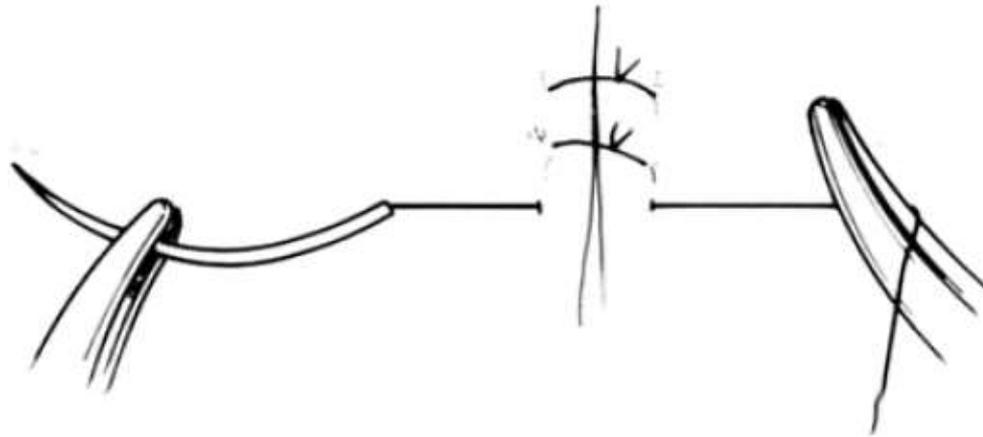
**Tissue Handling**

S9

**Handling of Vessel**

S10

**Tissue bite**



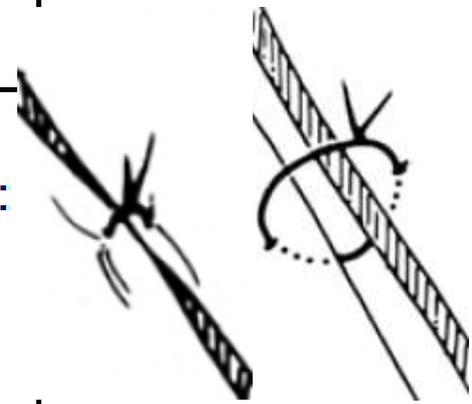
**Suture Handling**

**S11**

**suture damage**

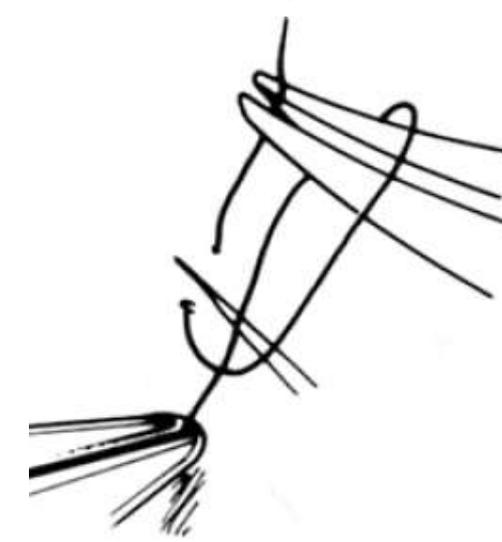
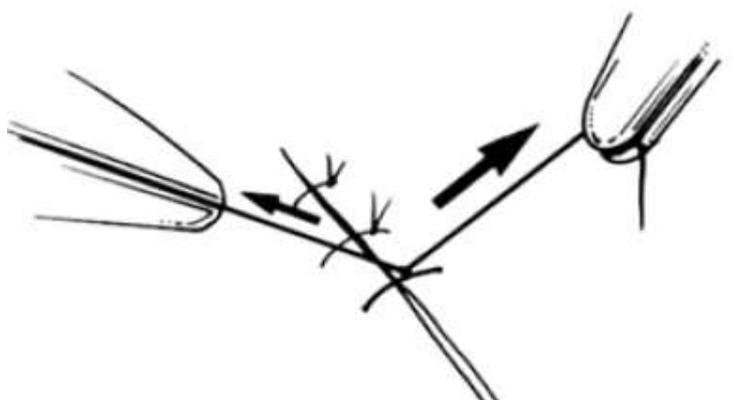
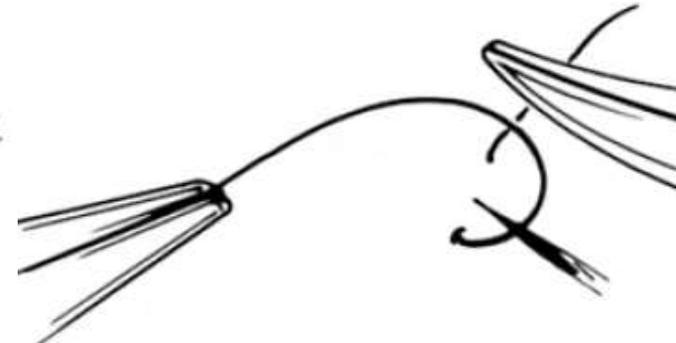
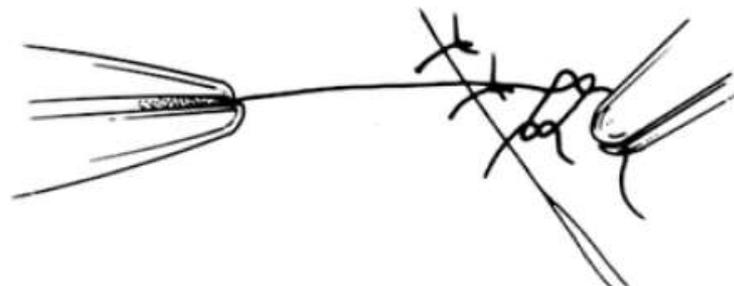
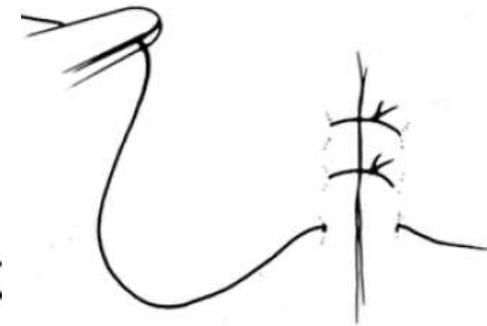
**S12**

**Make a loop in 4 steps:  
"Pick, loop, pick,  
tighten"**



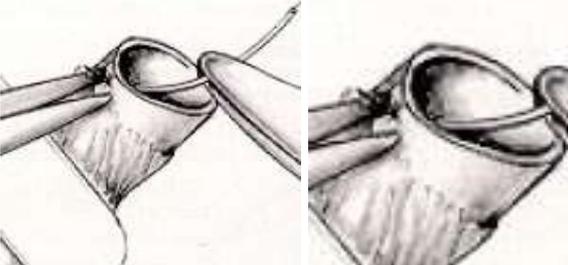
**S13**

**Knots tension and  
squaring**



**operative Flow**

<p>S14</p>	<p>Use of magnification</p>
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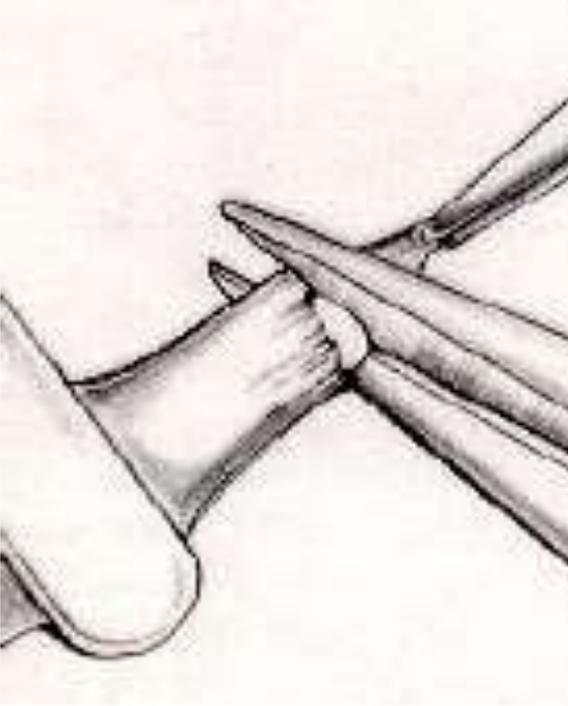
<p>S15</p>	<p>Operative Flow</p>
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<p>S16</p>	<p>Irrigation</p>
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<p>S17</p>	<p>Vessel Preparation</p>
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<p>S18</p>	<p>Time Taken for anastomosis (up to 10 stitches)</p>
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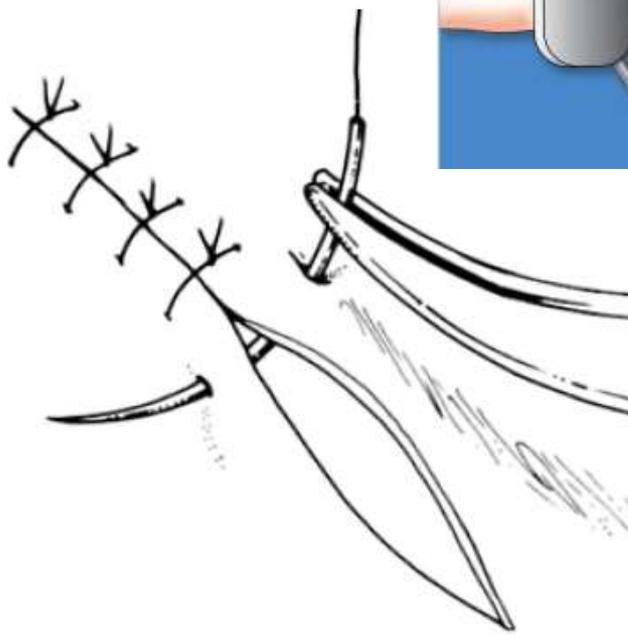
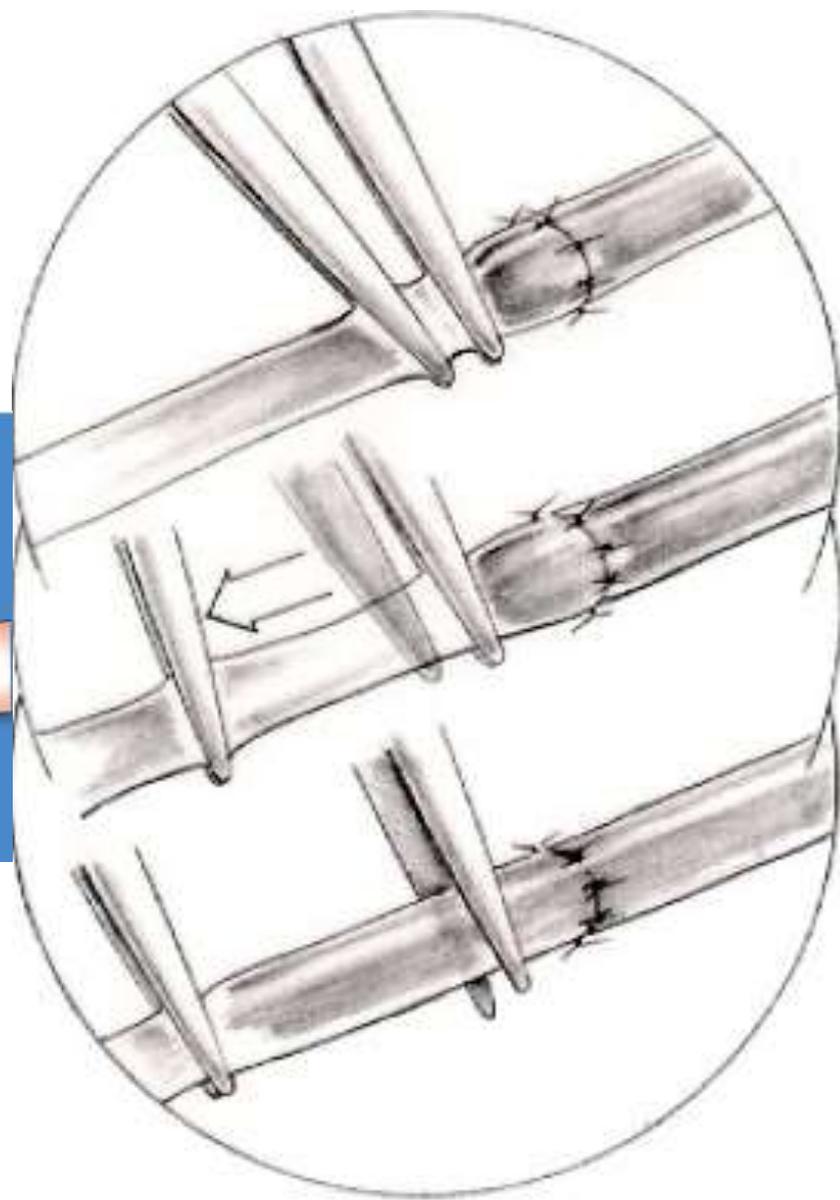
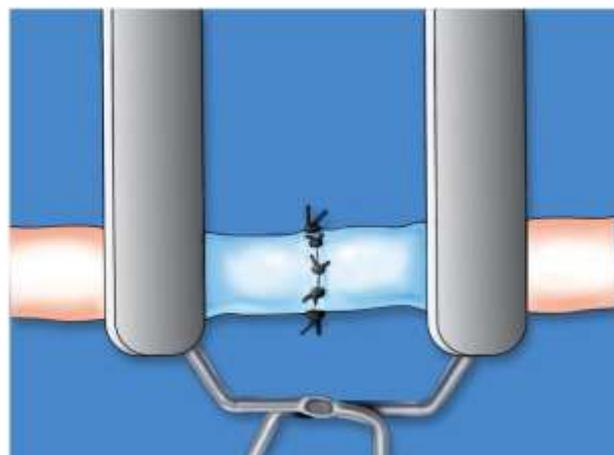


S19

#Quality of anastomosis

S20

Patency



# FUNDAMENTAL STEPS ON DIDACTIC PROGRESSION **MACRO**

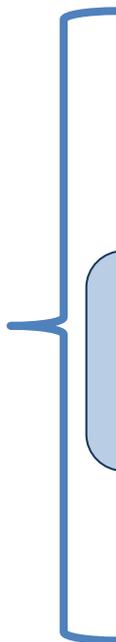
HOW TO MANAGE THE MICRO INSTRUMENTS

HOW TO DO THE SQUARE /  
FLAT KNOT

HOW TO MANAGE THE NAIL AND THE  
SUTURE

HOW TO PASS THE NEEDLE

**MACRO**



# FUNDAMENTAL STEPS ON DIDACTIC PROGRESSION

Handling microsurgical instruments, hand position when handling the instruments (instruments like a pen, thumbs look up (neutral position of the forearm) ulnar side of the hand on the table) .

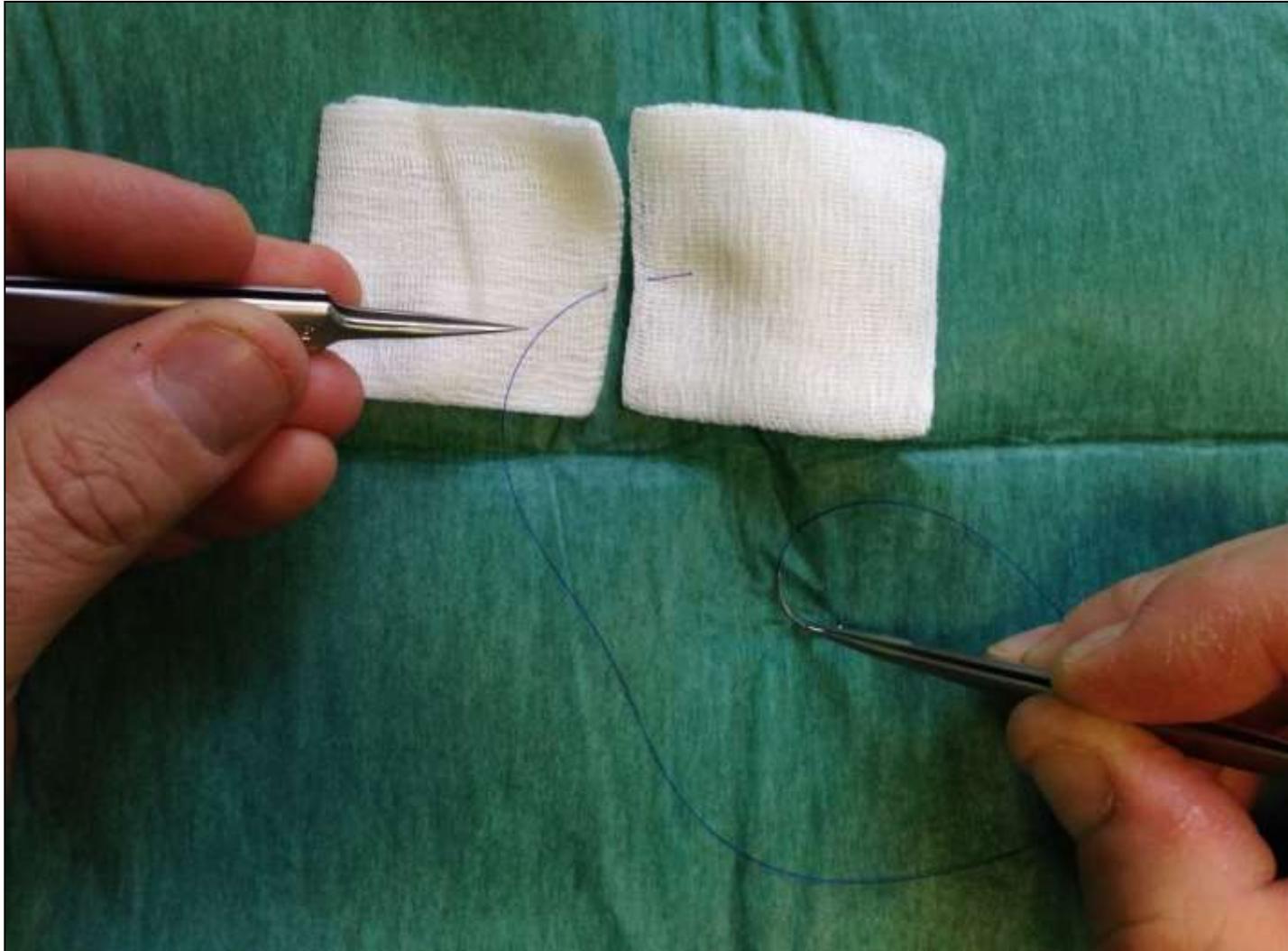
**How to give a flat knot on a gauze 3-0 silk suture, or similar, with MICROSURGICAL INSTRUMENTS**

*Minimum requirement to pass to the next step :*  
the students have to perform

**20 CONSECUTIVE FLAT KNOTS CHANGING HANDS AND /OR WHEN THE TUTOR DECIDES.**

# THE KNOT

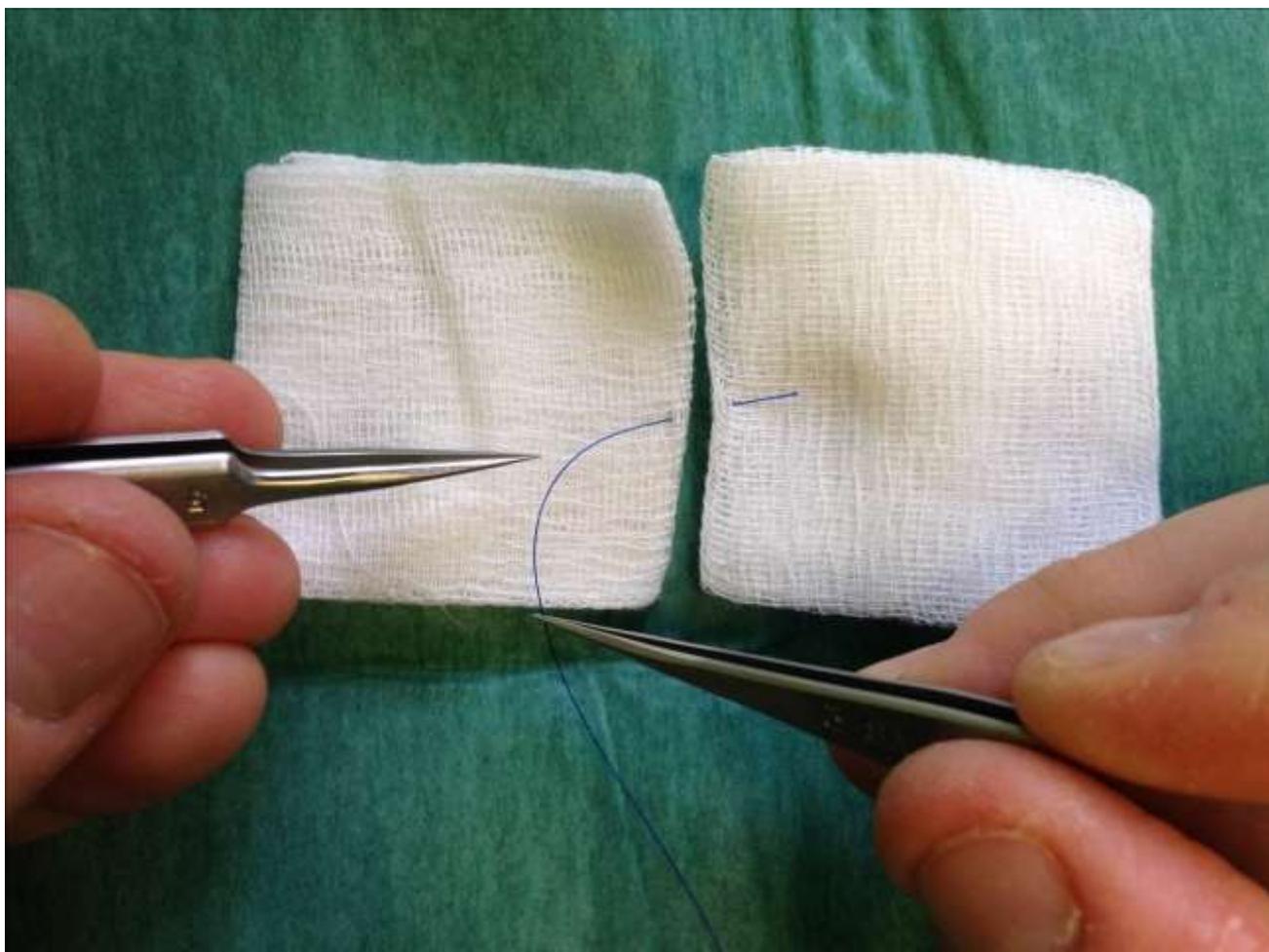
leave the needle





# KNOT IN FOUR STEPS

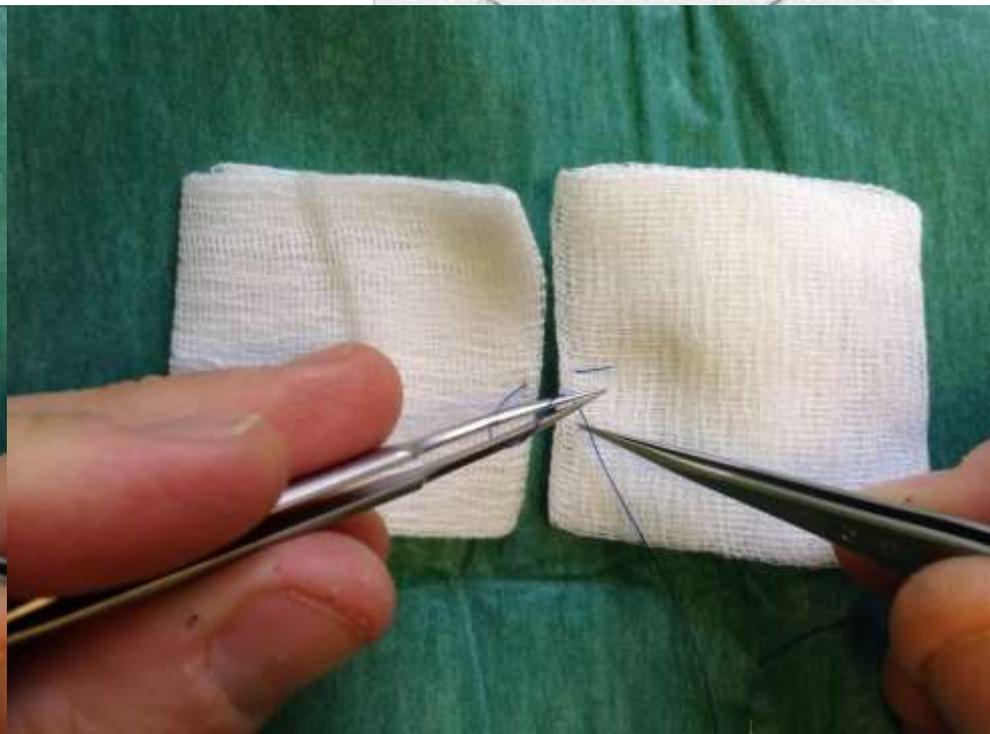
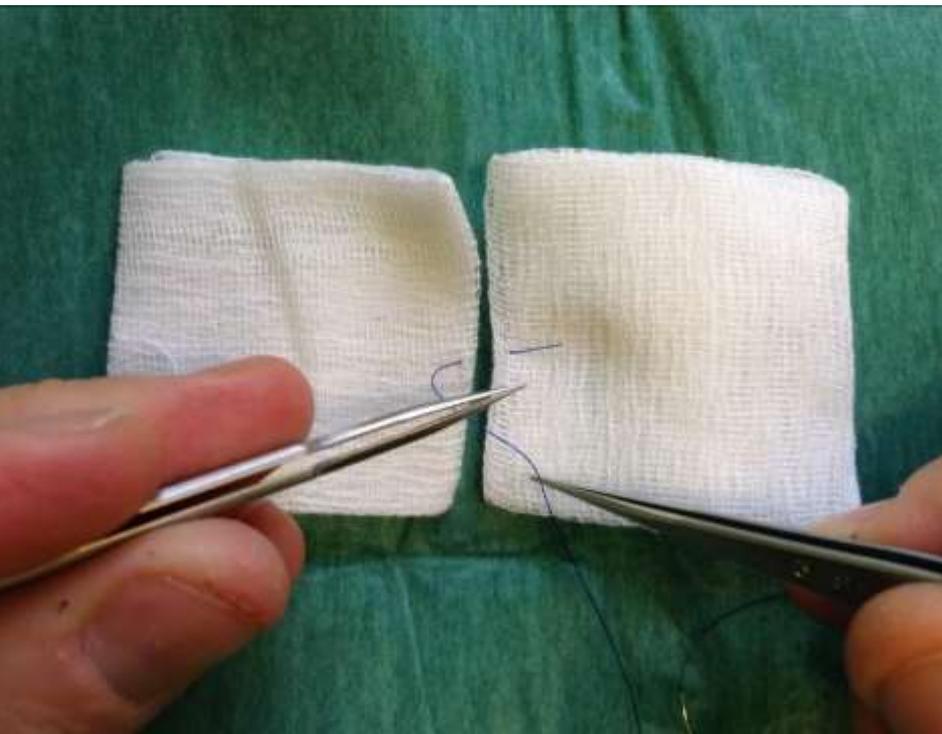
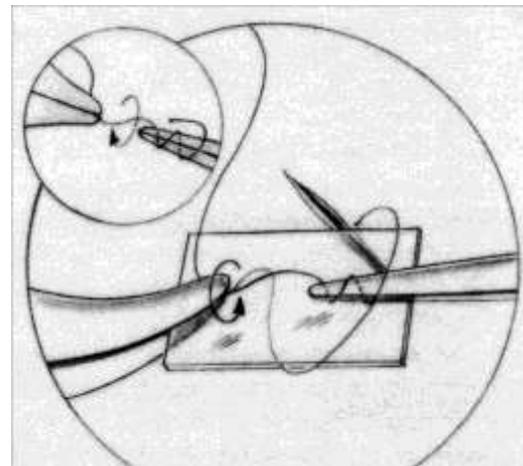
1) Pick up the suture (right) and look at tie (left)





# KNOT IN FOUR STEPS

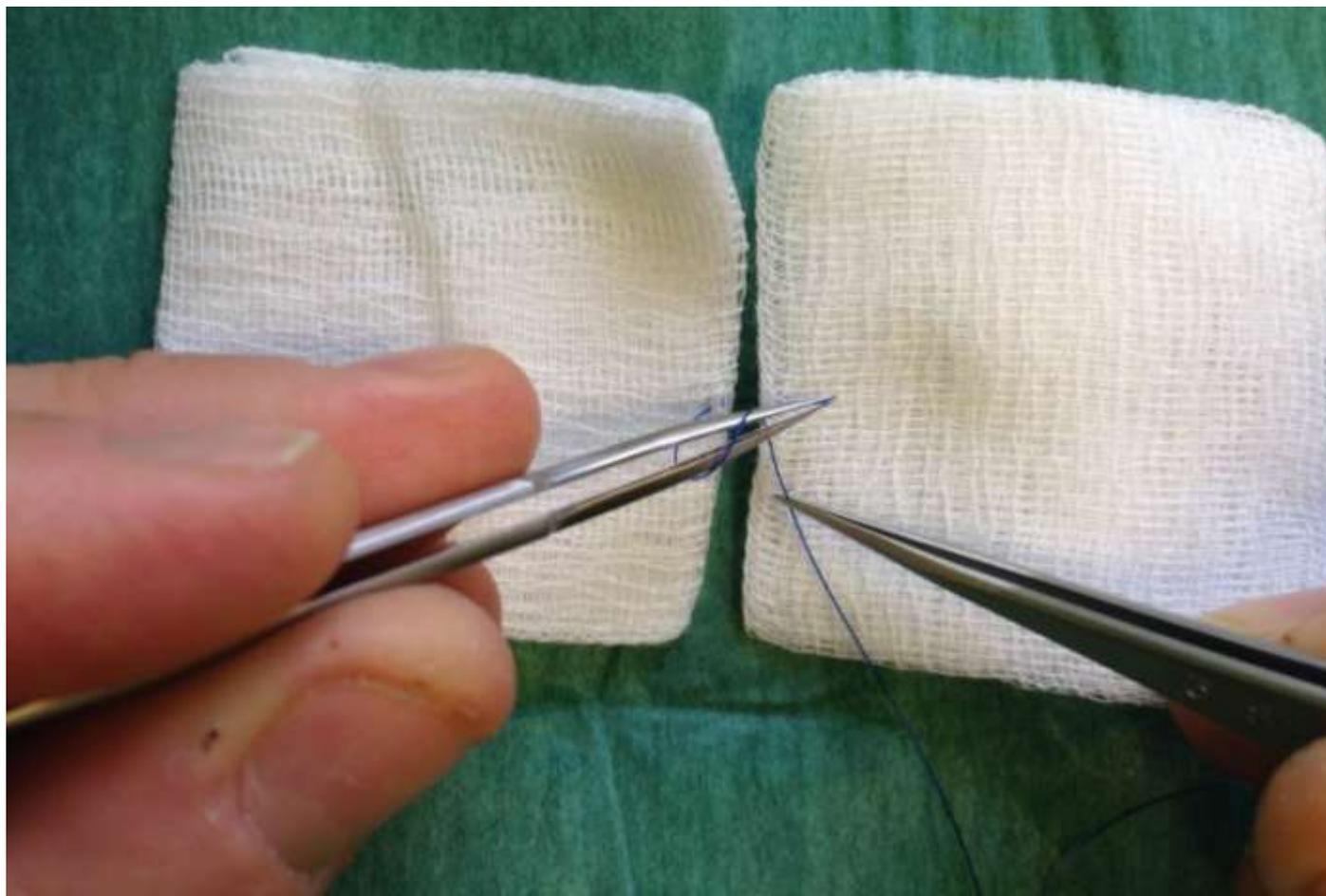
2) Turn the suture around the forcep LOOP





# KNOT IN FOUR STEPS

## 3. TAKE THE TAIL





# KNOT IN FOUR STEPS

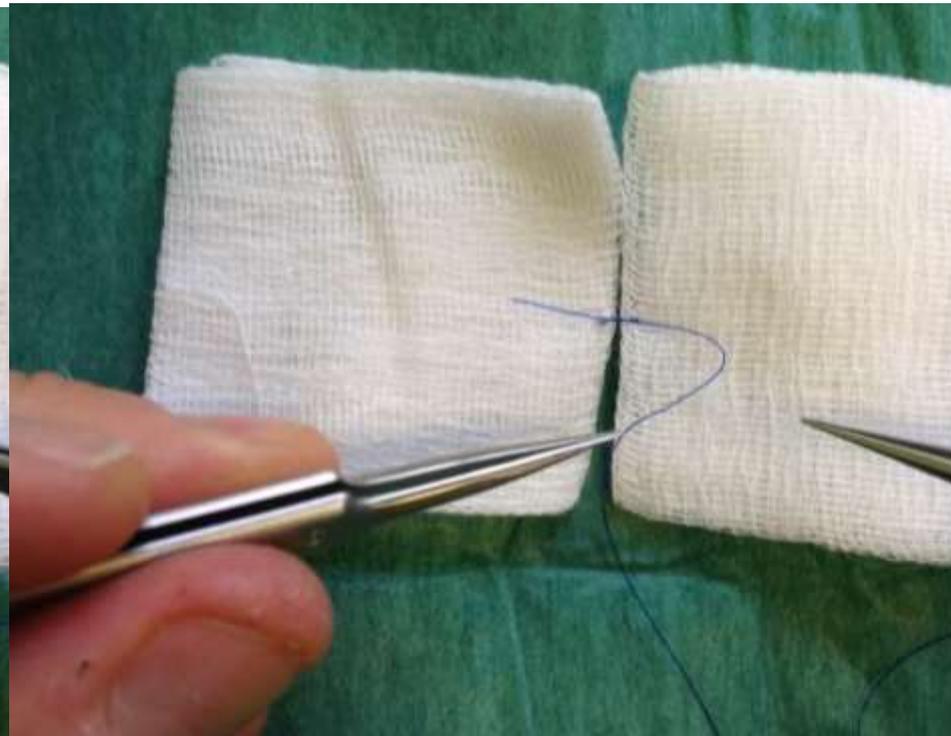
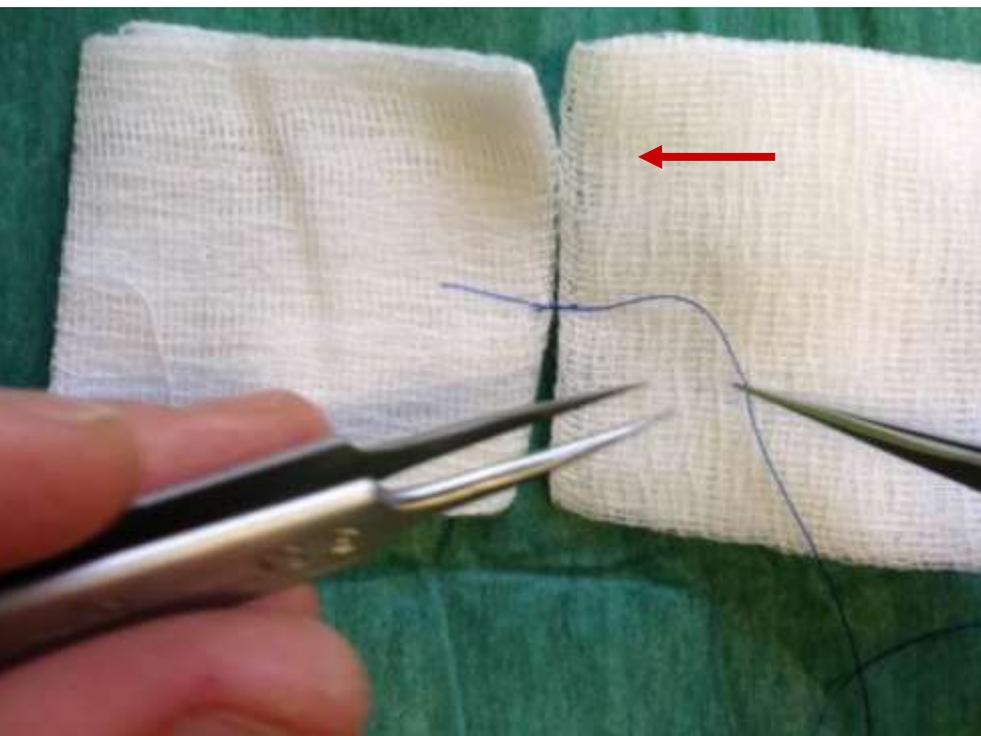
## 4. PULL - TIGHTEN

SQUARE KNOT

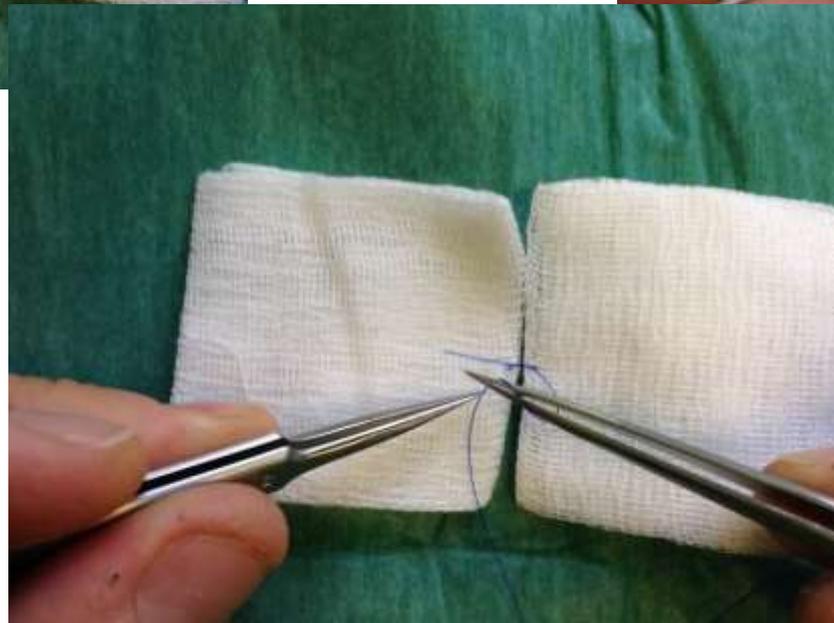
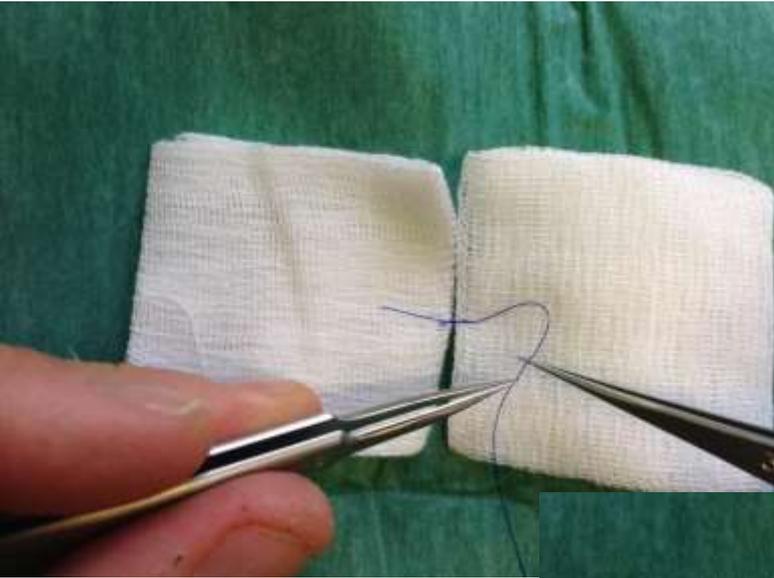


# SECOND KNOT

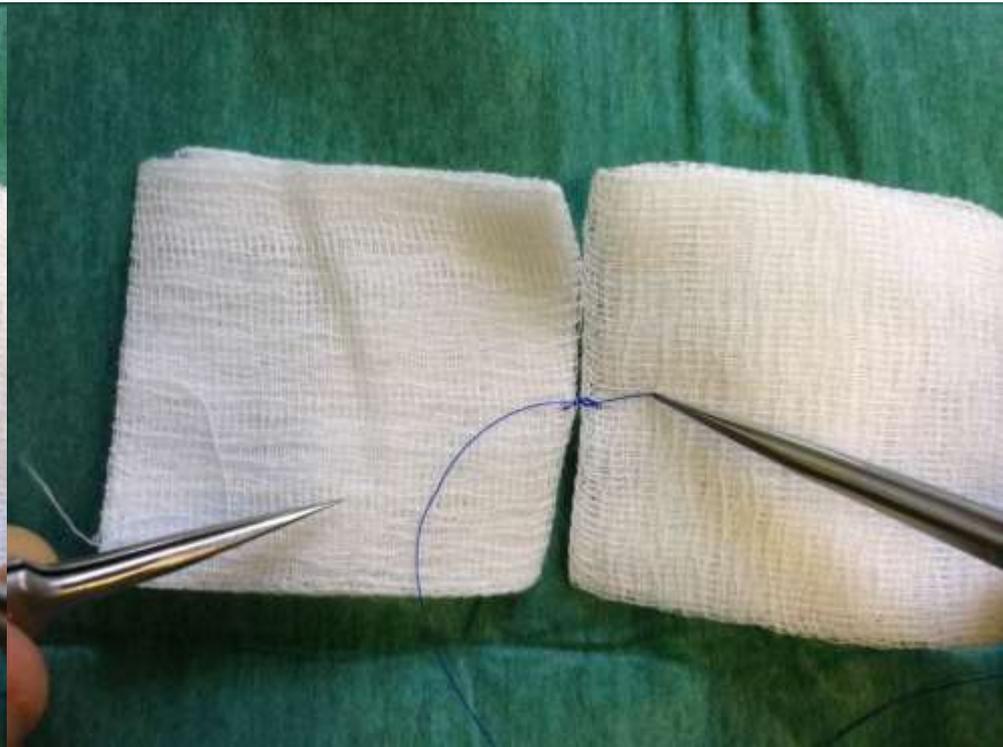
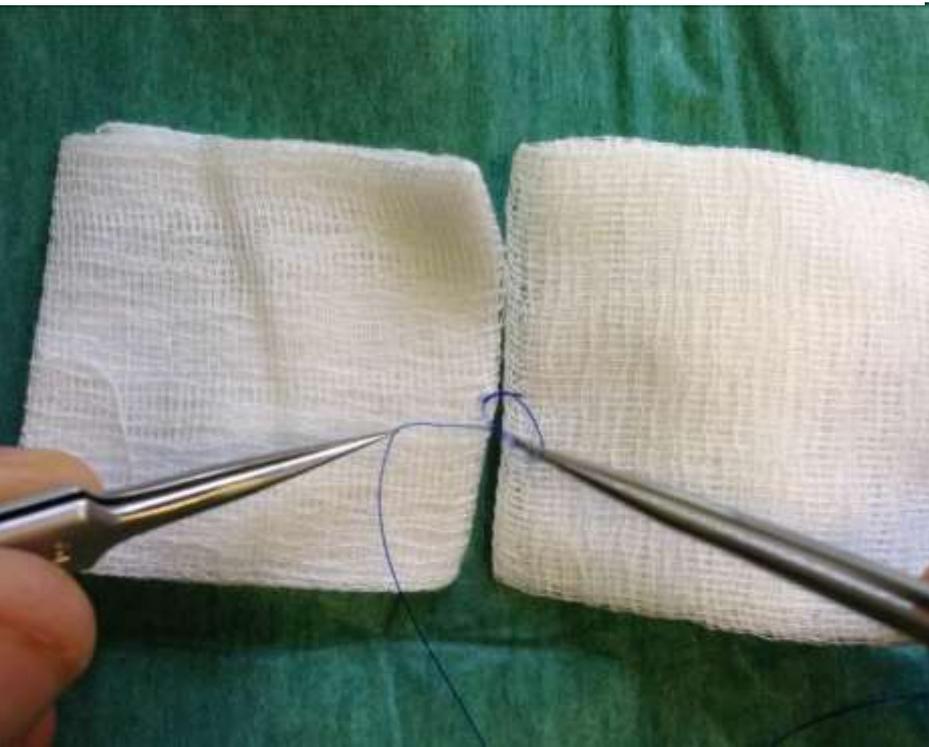
CHANGE THE HAND



# SECOND KNOT

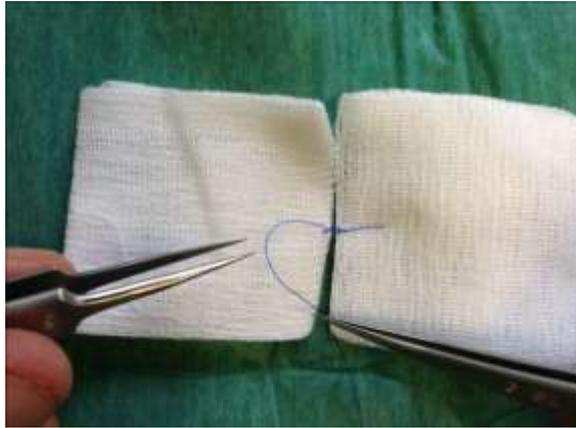


# SECOND KNOT

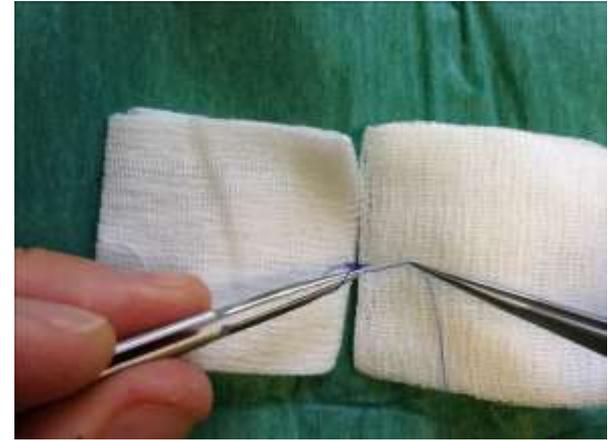


# THIRD KNOT

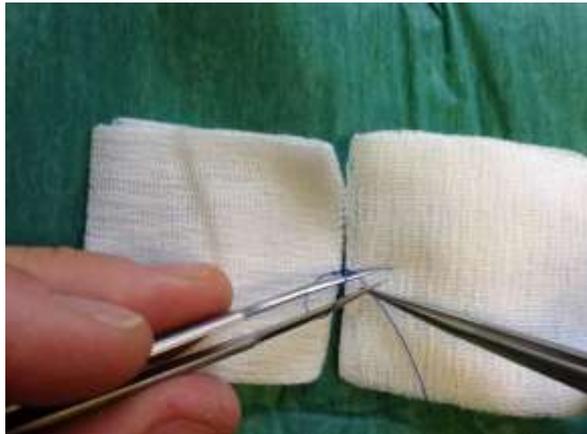
change the hand



1. Take the suture



2. turn



3. Take the tail



4. pull

During this “macro” step will be shown also

**HOW AND WHERE TO HANDLE THE NEEDLE,  
how to pick it up (in three moves)**

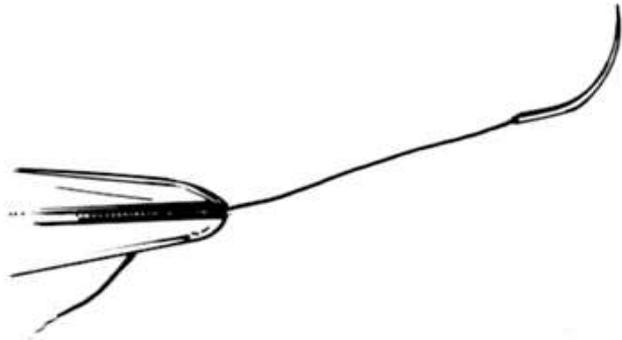
GRS is used to teach clarify and explain

IS A

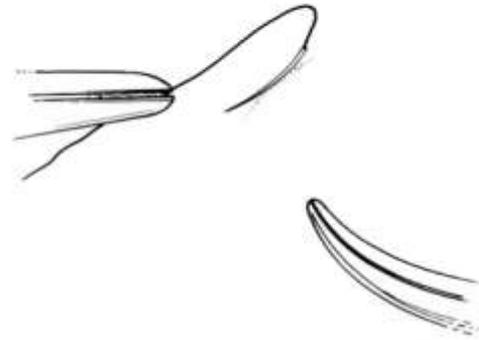
“PARTIAL” RATING SCORE

# HOW TO PICK UP THE NEEDLE IN THREE STEPS

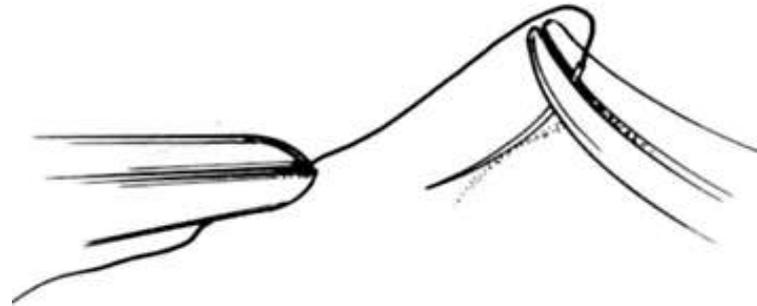
1



2

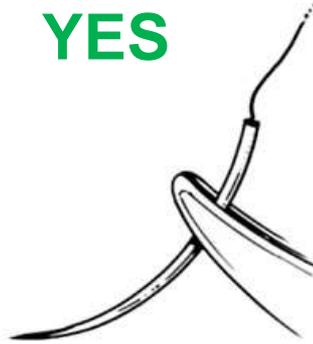


3



# WHERE HOLD THE NEEDLE

YES



NO



NO



# FUNDAMENTAL STEPS ON DIDACTIC PROGRESSION **MICRO**

TEACHING ON THE MICROSCOPE

OPTICAL INFORMATION , INSTRUMENTS

INSTALLATION, VISION

**ergonomics principles on the microscope**

**correct microsurgical installation and vision (initial single vision, then binocular focus, maximum magnification, the eyes are always on the operating field, etc ).**

# FUNDAMENTAL STEPS ON DIDACTIC PROGRESSION **MICRO**

STITCHES ON A GAUZE

STITCHES ON A PRACTICE CARD

STITCHES ON A SILICON TUBE

STITCHES ON CHICKEN LEGS

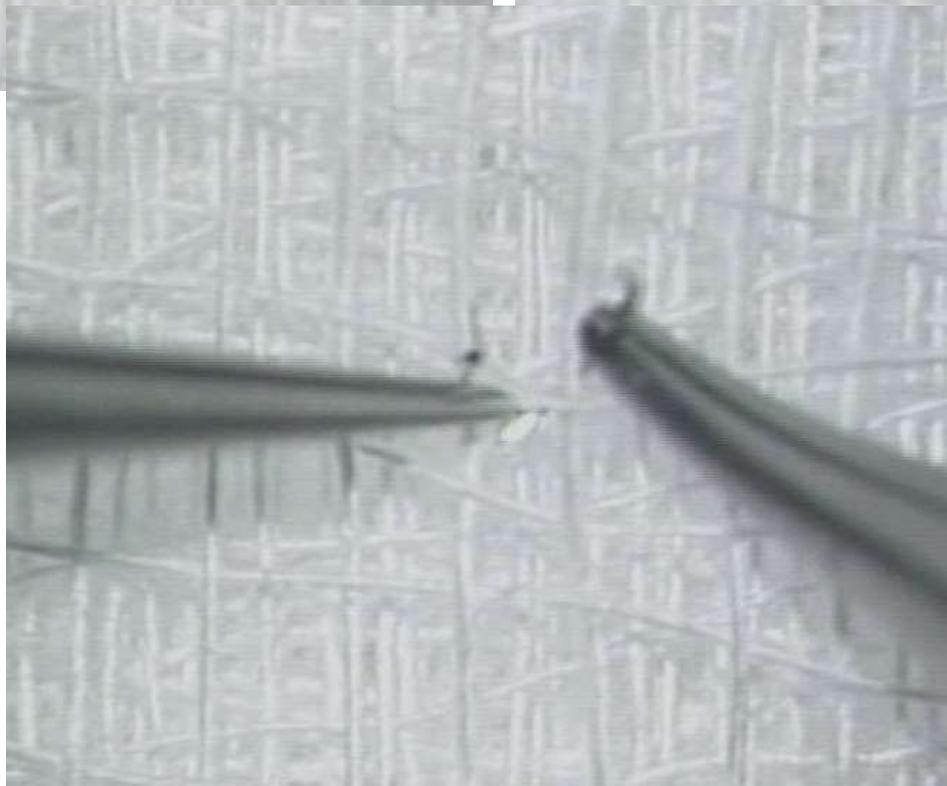
# **STICHES ON A GAUZE**

**FIRST PRACTICE ON GAUZE WITH 8-0 NYLON SUTURE. THE STUDENTS HAVE TO LEARN HOW TO KEEP A SHORT TAIL (1-2 SQUARES)**

**FIRST EXERCISE CONSISTS IN PERFORMING A SUTURE IN 5 DIFFERENT SQUARES INTERSECTIONS OF A GAUZE UNDER MICROSCOPE MAGNIFICATION, FOR EVERY SQUARE THEY HAVE TO PERFORM 3 KNOTS IN MAX 15" (SAME EXERCISE DONE BEFORE WITH THE MACRO).**



KEEP A SHORT TAIL



# for teachers

Attention is focused on:

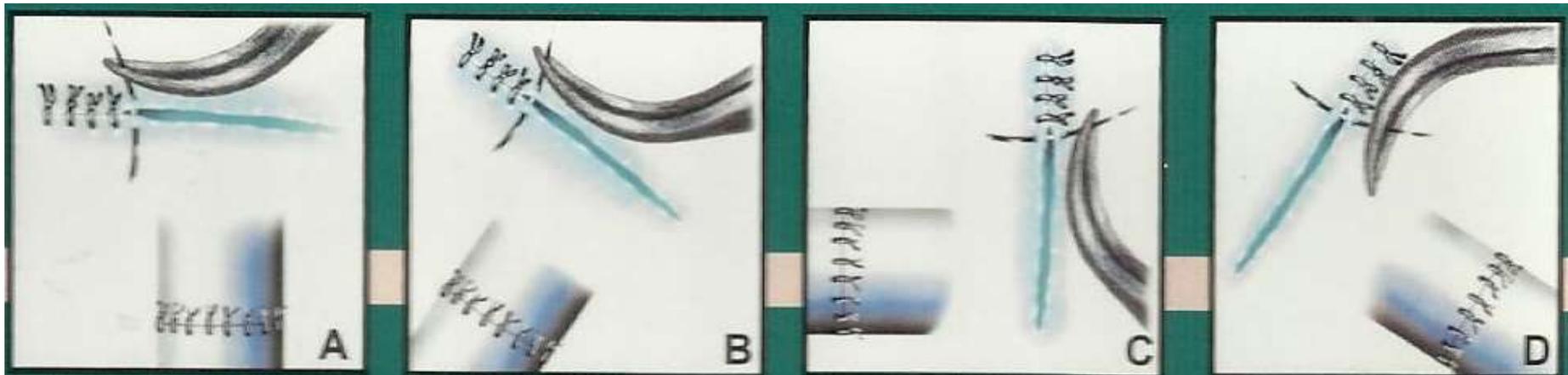
ergonomics and tremor, how to pick up the needle in three steps, how to give a flat knot, keep short tail, high magnification when the stitch is passed and lower when the knot is done

see GRS

- *Minimum requirement to pass to the next step*  
: 5 different squares intersections of a gauze under microscope magnification, for every square they have to perform 3 knots in max 15" and /or when the tutor decides.

# STITCHES ON A PRACTICE CARDS

sutures in 4 different training positions (-/|\)



# STITCHES ON A PRACTICE CARDS

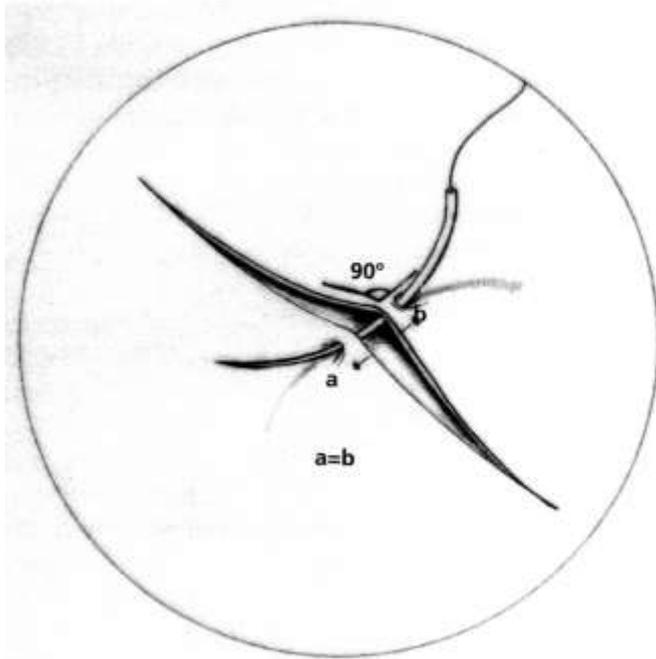
## for teachers

Attention is focused on:

how to enter the vessel wall, how much tension is needed to approach the walls, the distribution of the stitches.

# STITCHES ON A PRACTICE CARDS

how much  
tissue



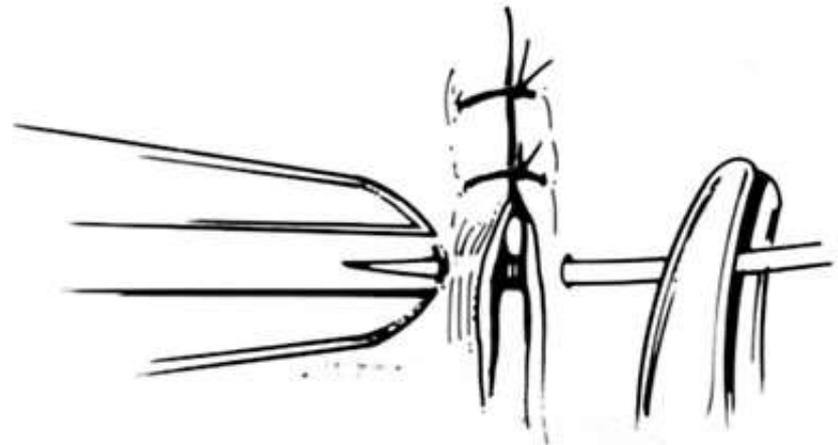
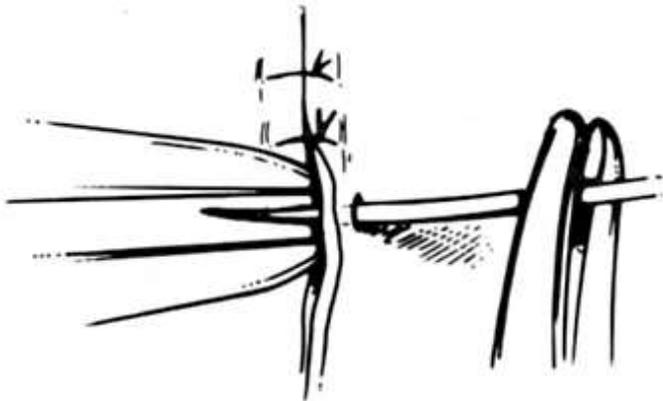
distribution  
of stiches



$a=b$   $\longrightarrow$  2 times the diameter of the needle

# STITCHES ON A PRACTICE CARDS

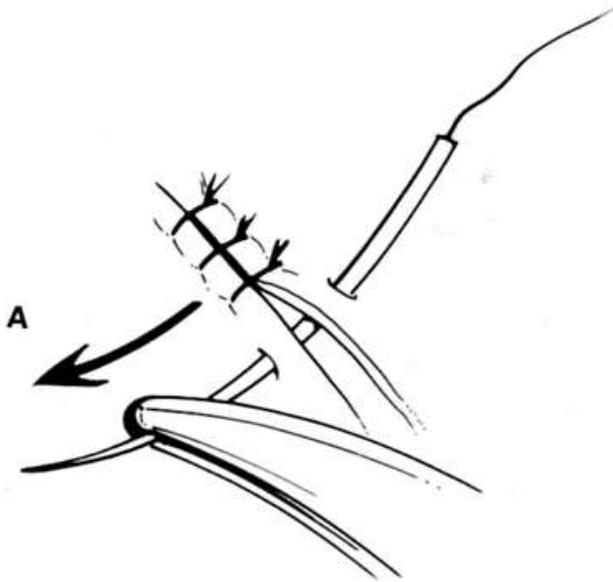
how to enter in the vessel wall  
and driving needle trough the vessel



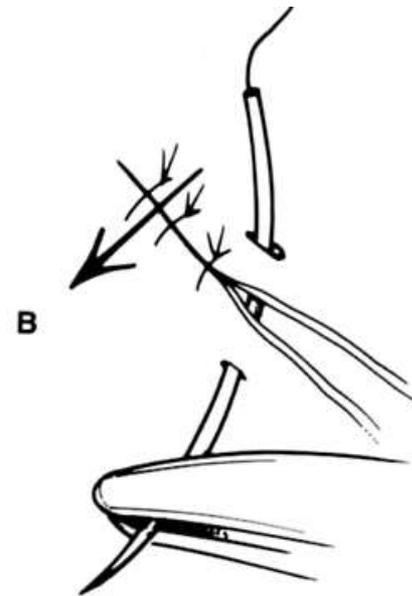
# STITCHES ON A PRACTICE CARDS

how to rescue the needle

YES



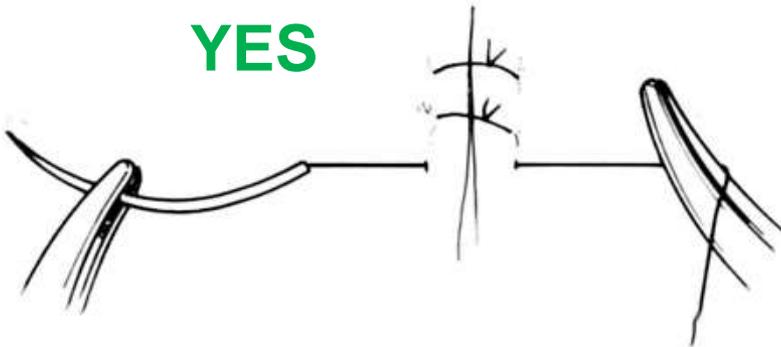
NO



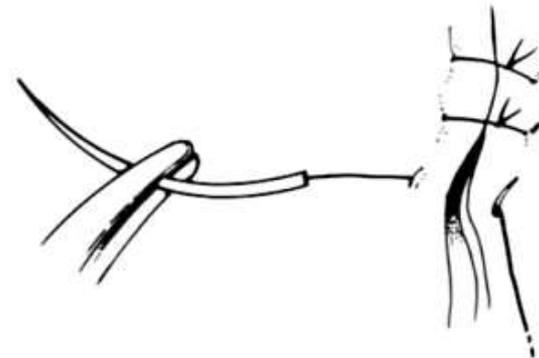
# STITCHES ON A PRACTICE CARDS

## Rescue the stich

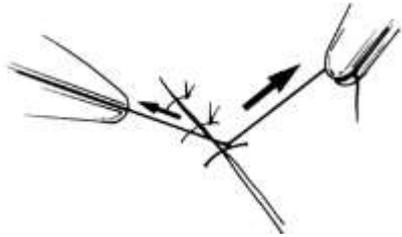
YES



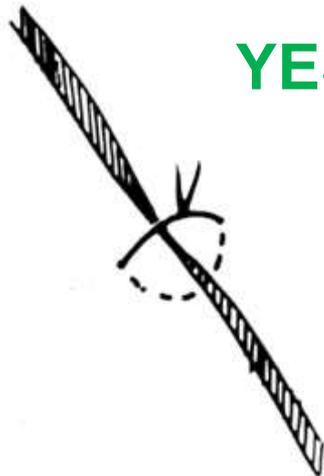
NO



# STITCHES ON A PRACTICE CARDS



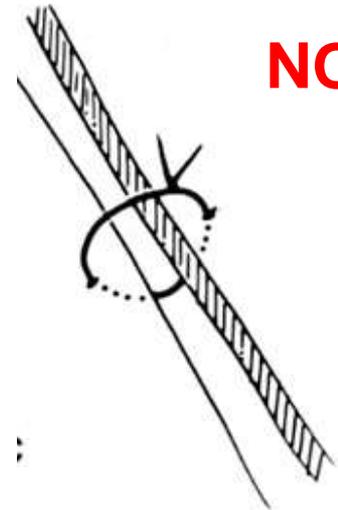
the tension



YES



NO



NO

# STITCHES ON A PRACTICE CARDS

*Minimum requirement to pass to the next step :*

*The student can reach the next step when the student has completed*

*8 stitches on every position (3 knots for stitch)*

*and /or when the tutor decides*

**At the end the analysis of the single stitches from inside is done (ALI score)**

# STITCHES ON A PRACTICE CARDS

ALI GHANEM  
2014

Trainee: \_\_\_\_\_ Assessor: \_\_\_\_\_ Date: \_\_\_\_\_  
Technique: bi-angulation / triangulation/ backwall/ other: \_\_\_\_\_



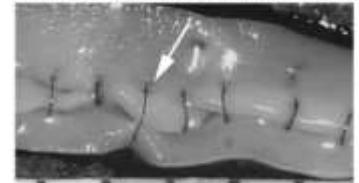
Error 1: Disruption of the anastomosis line



Error 2: Backwall or sidewall catch



Error 3: Oblique stitch causing distortion



Error 4: Bite leading to tissue infoldment



Error 5: Partial thickness stitch



Error 6: Unequal distancing of sutures



Error 7: Visible tear in vessel wall



Error 8: Strangulation of tissue edges



Error 9: Thread in lumen



Error 10: Large edge overlap

## Anastomosis Lapses:

Error type:	Frequency:
Error 1:	
Error 2:	
Error 3:	
Error 4:	
Error 5:	
Error 6:	
Error 7:	
Error 8:	
Error 9:	
Error 10:	

Comments:

---

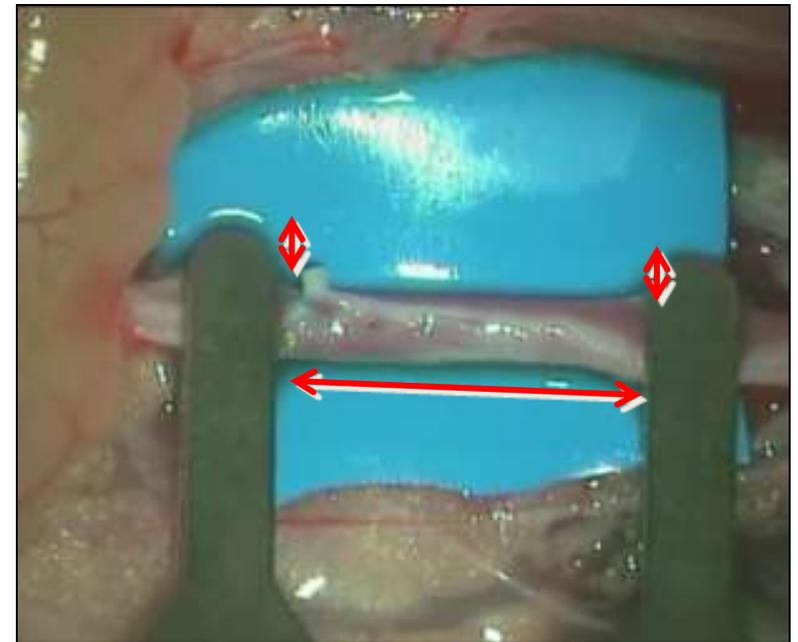
Anastomosis Laps Index Score:

## Skill Level

Novice ALI > 6	Intermediate ALI 3-6	Expert ALI < 3
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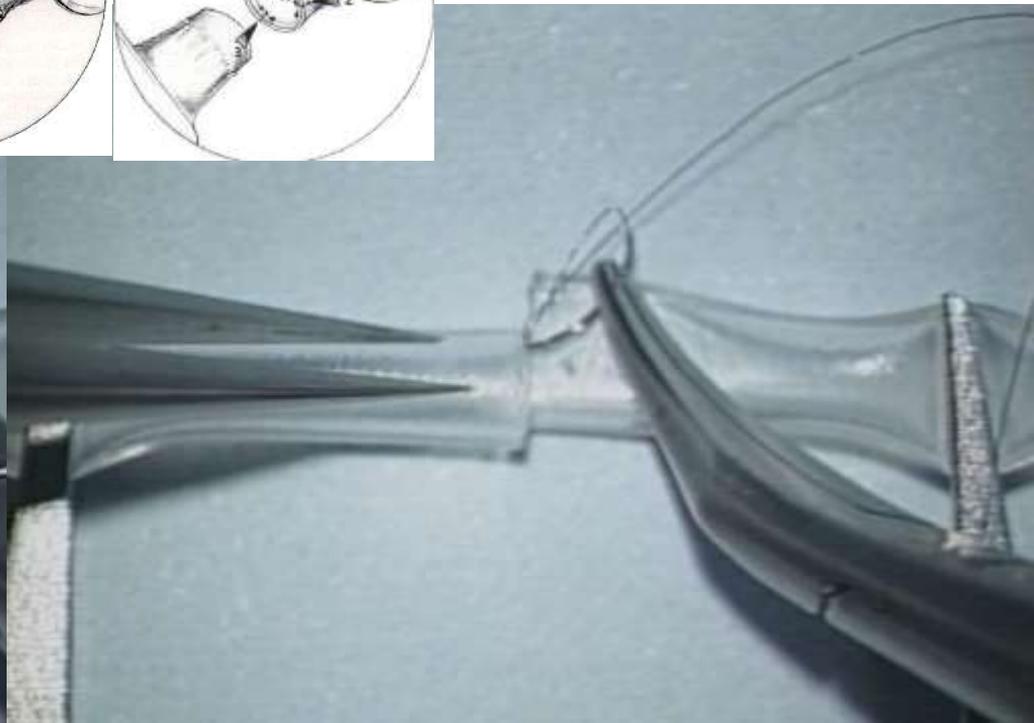
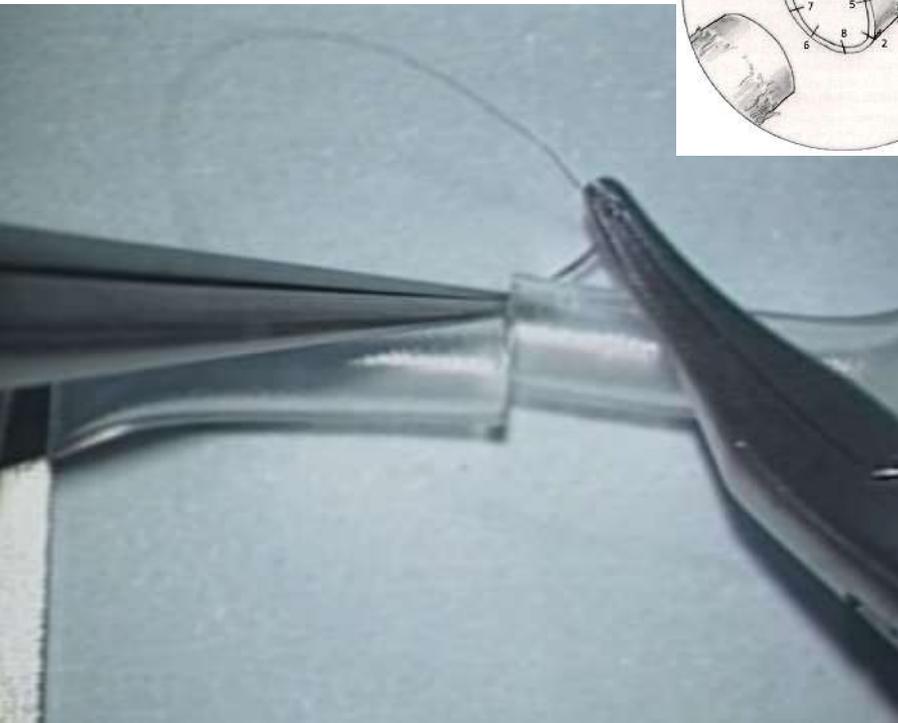
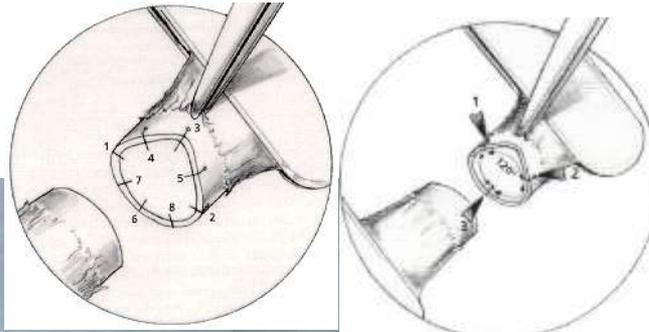
# STITCHES ON A SILICON TUBE

managing and positioning the approximator

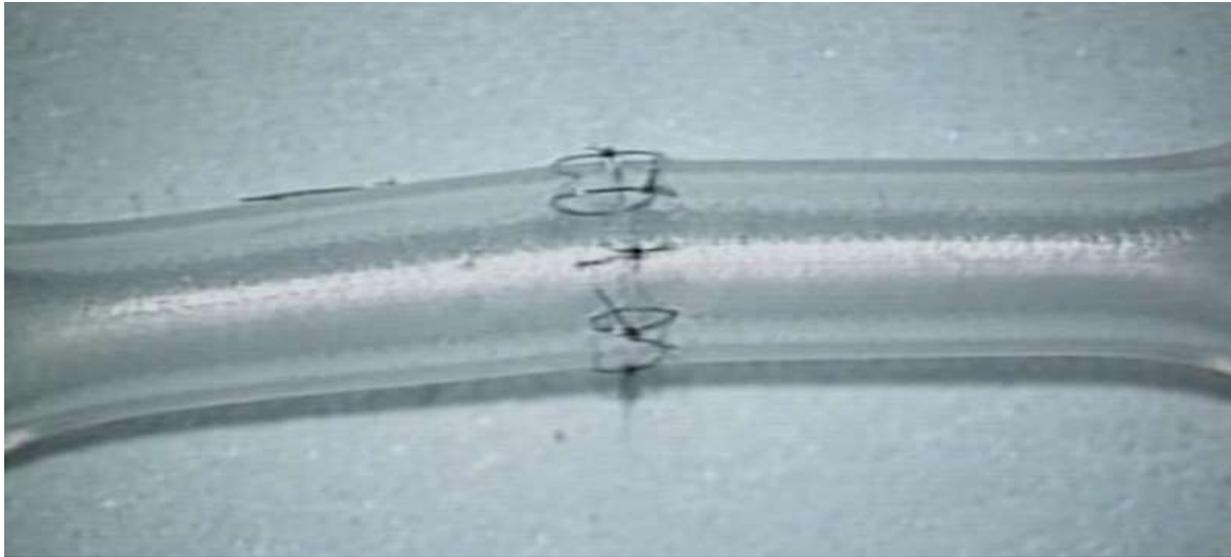


# STITCHES ON A SILICON TUBE

how to enter the vessel wall  
architecture of the suture ( $180^\circ$  or  $60^\circ$ )



# STITCHES ON A SILICON TUBE

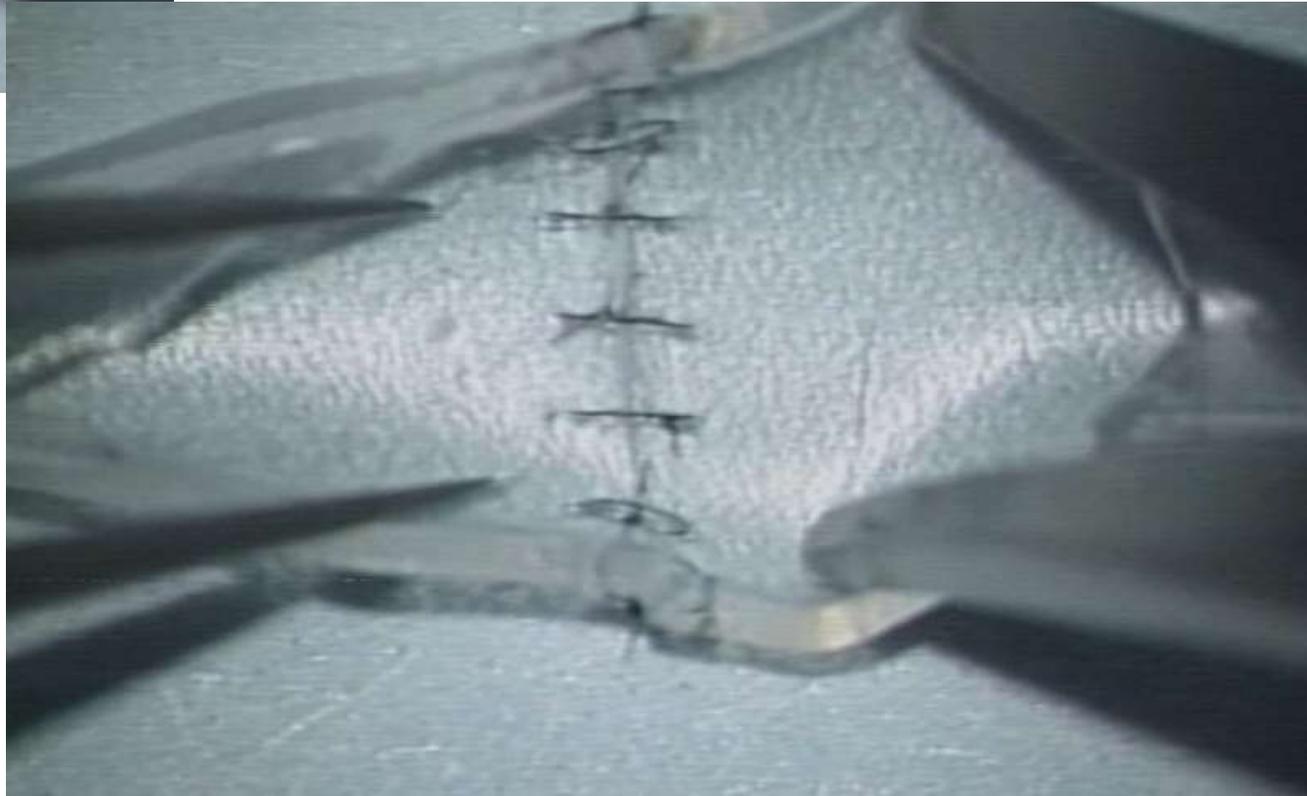


Minimum requirement to pass to the next step :

The student can reach the next step when the student has completed

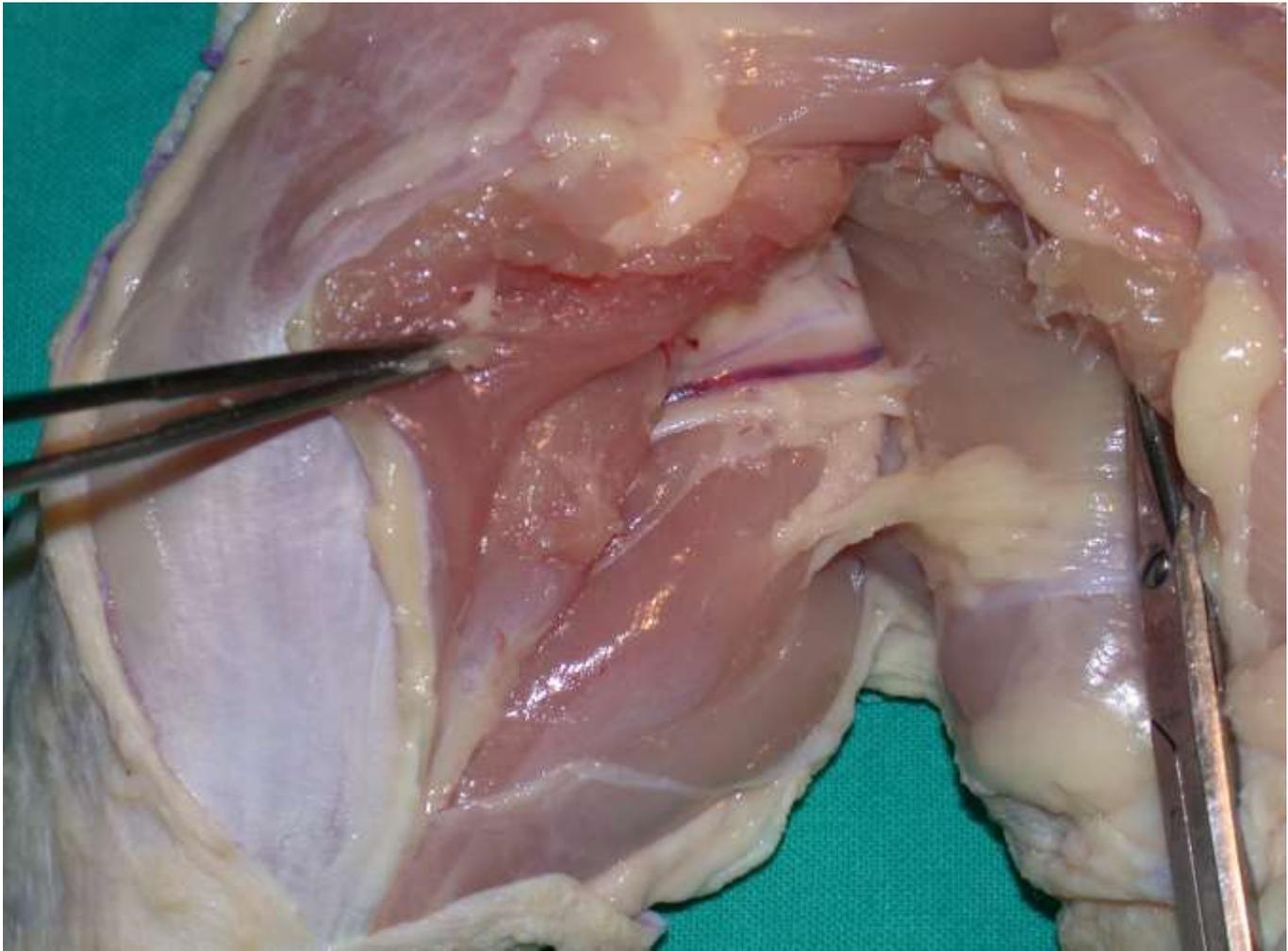
**Minimum exercise: 2-3 complete tube sutures.  
(16/24 stitches).**

# STITCHES ON A SILICON TUBE



# STITCHES ON A CHICKEN MODEL

*tight and lower limb*



# STITCHES ON A CHICKEN MODEL

Different approach to vessels will be presented by videos, then the students will perform complete dissections to reach femoral vessels.

Basic exercise consists of **femoral artery and vein termino-terminal suture.**

# STITCHES ON A CHICKEN MODEL

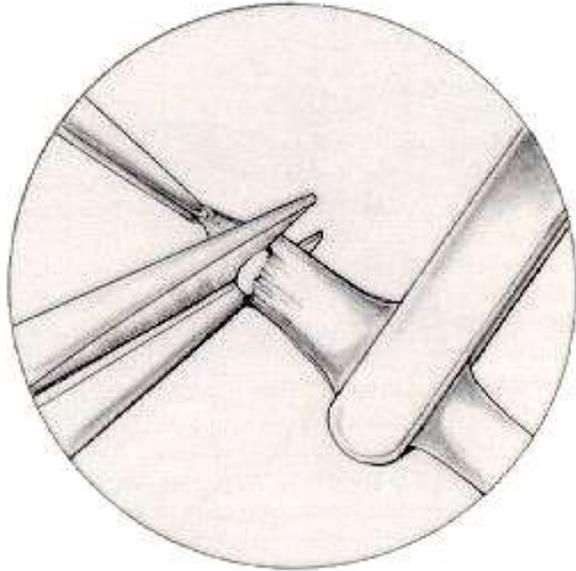
## DISSECTION TECHNIQUE

TISSUE HANDLING ... ONLY THE ADVENTITIA



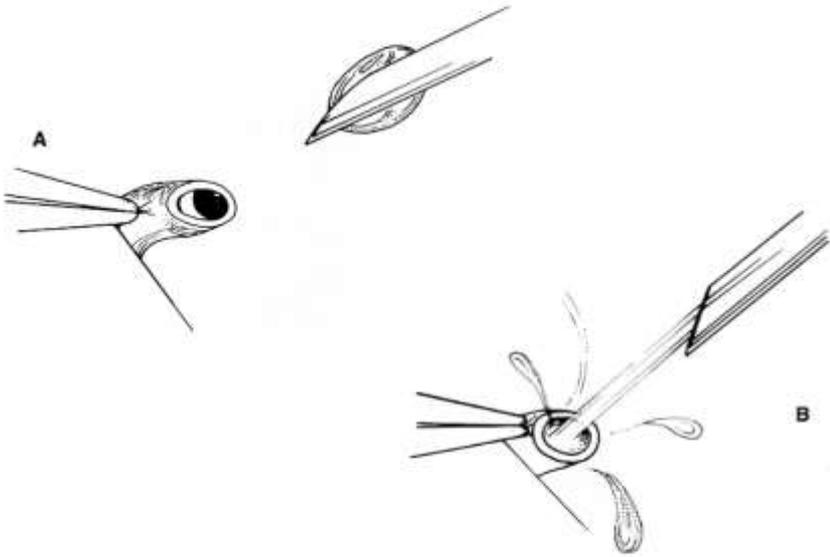
# STITCHES ON A CHICKEN MODEL

## ADVENTIZIECTOMY BACKGROUND

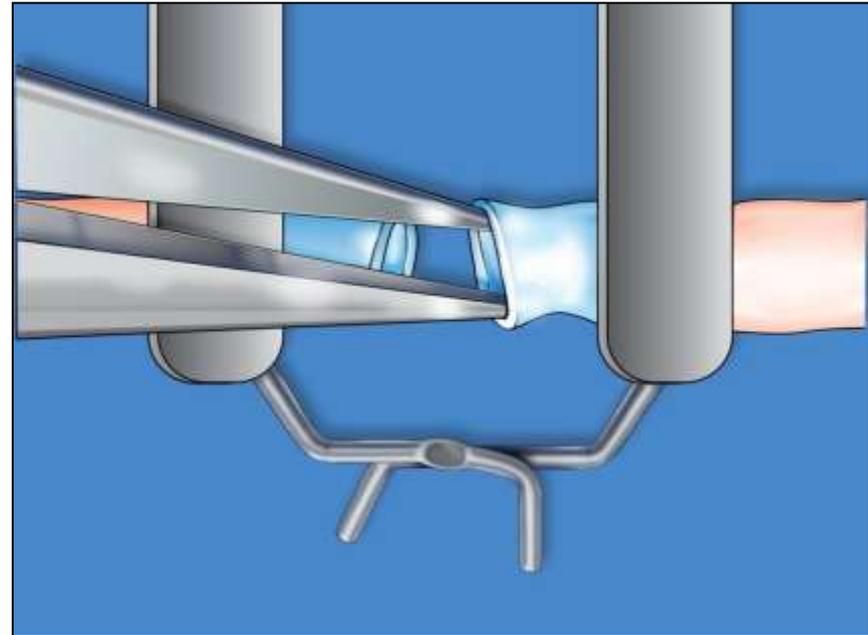


# STITCHES ON A CHICKEN MODEL

## IRRIGATION



## DILATATION



# STITCHES ON A CHICKEN MODEL

During the first procedure the **GRS modified score will be used to evaluate the student (time 0),**

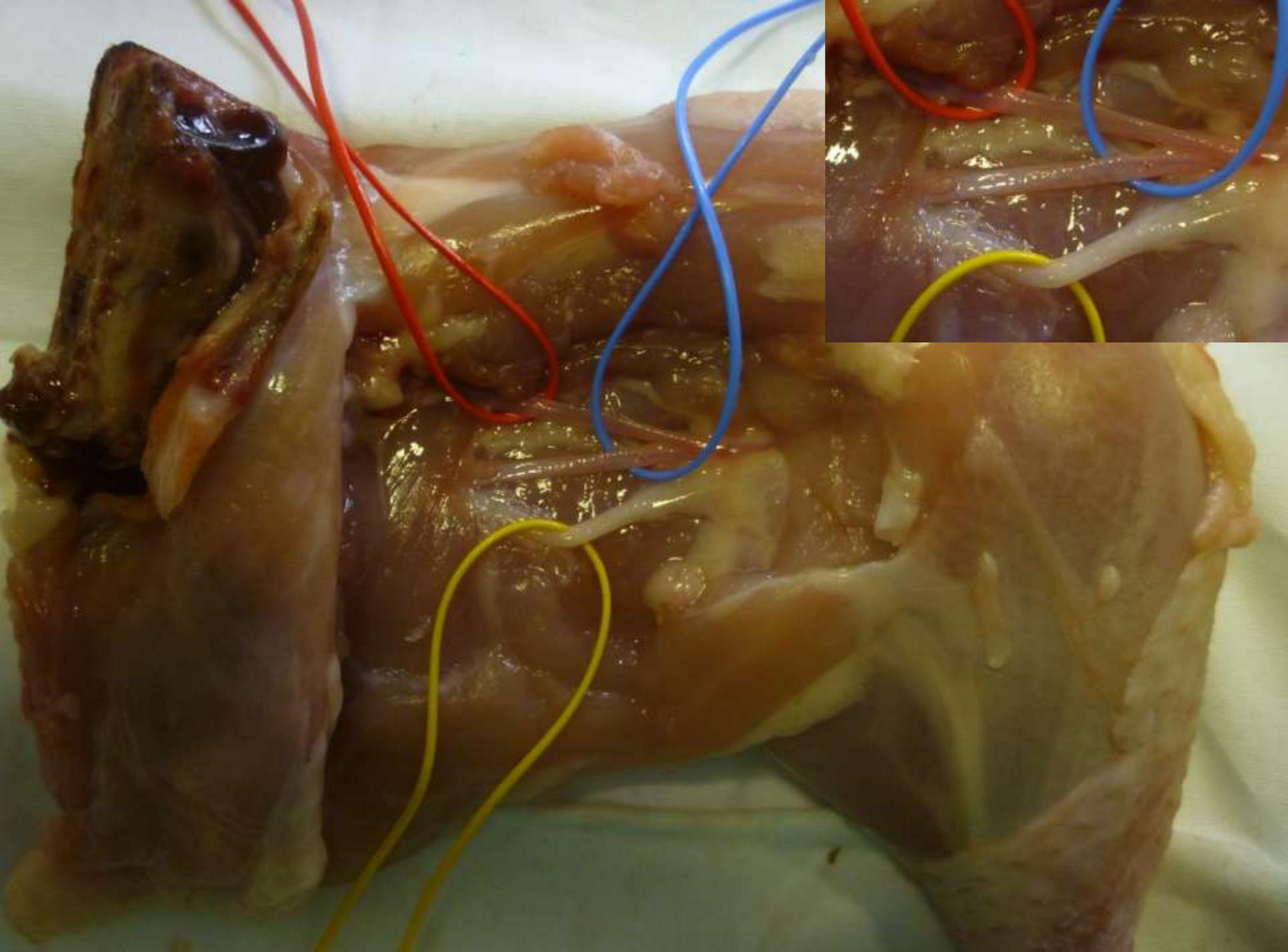
at the end the suture patency will be ascertained by coloured physiologic solution injected into the artery.

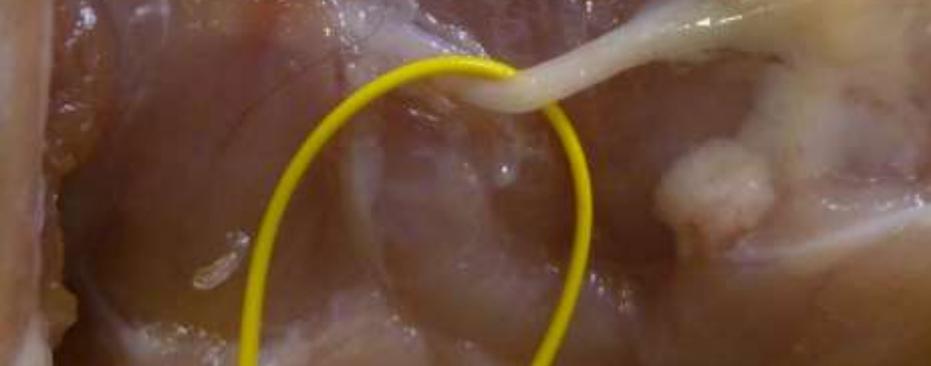
The ALI score will be applied to evaluate the stitches inside the vessels.

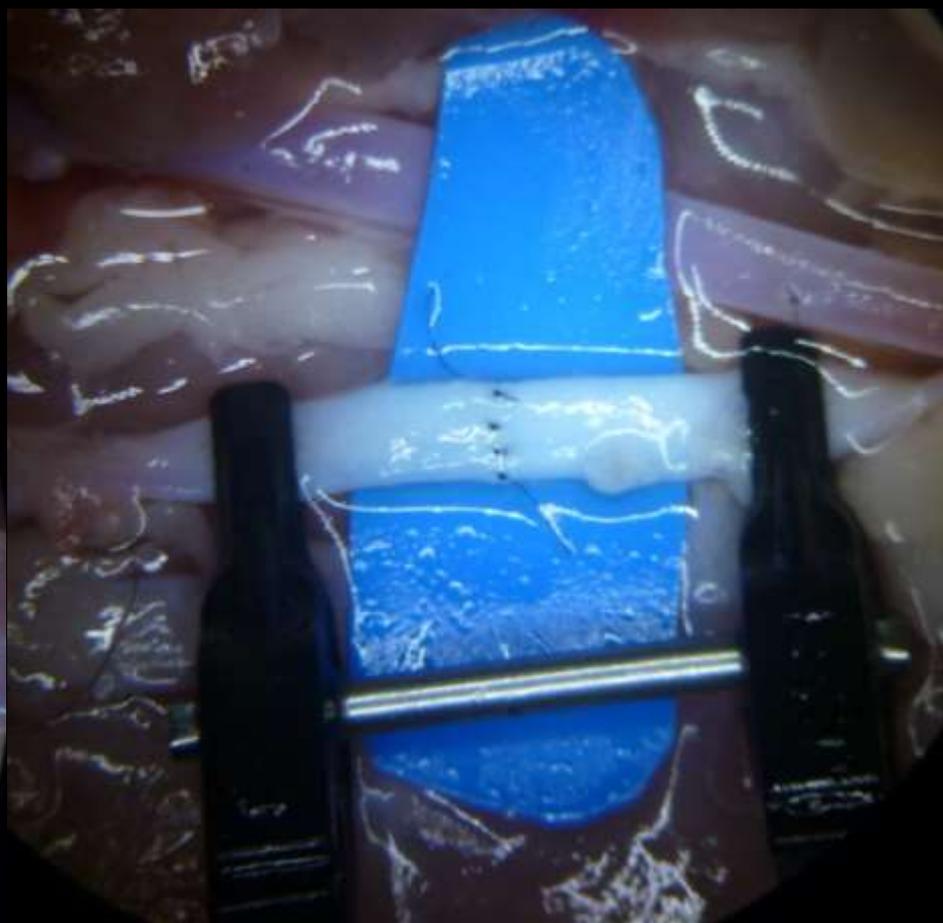
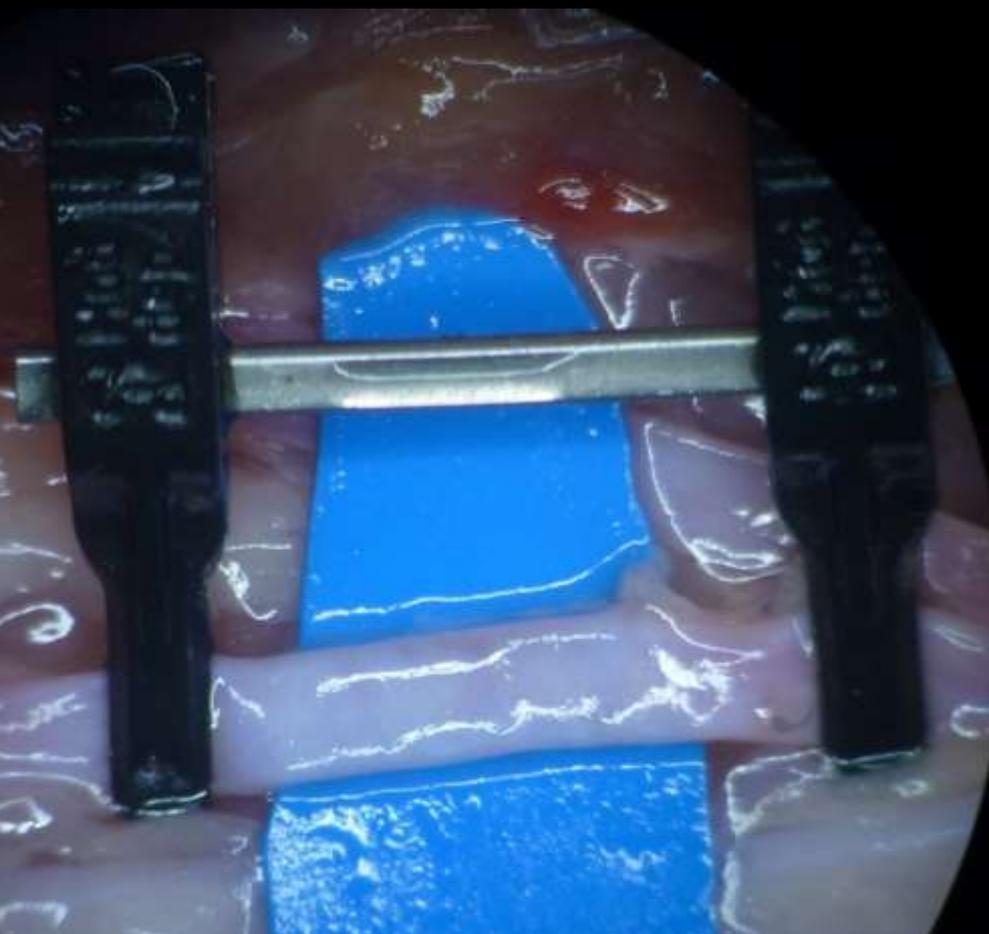
# STITCHES ON A CHICKEN MODEL

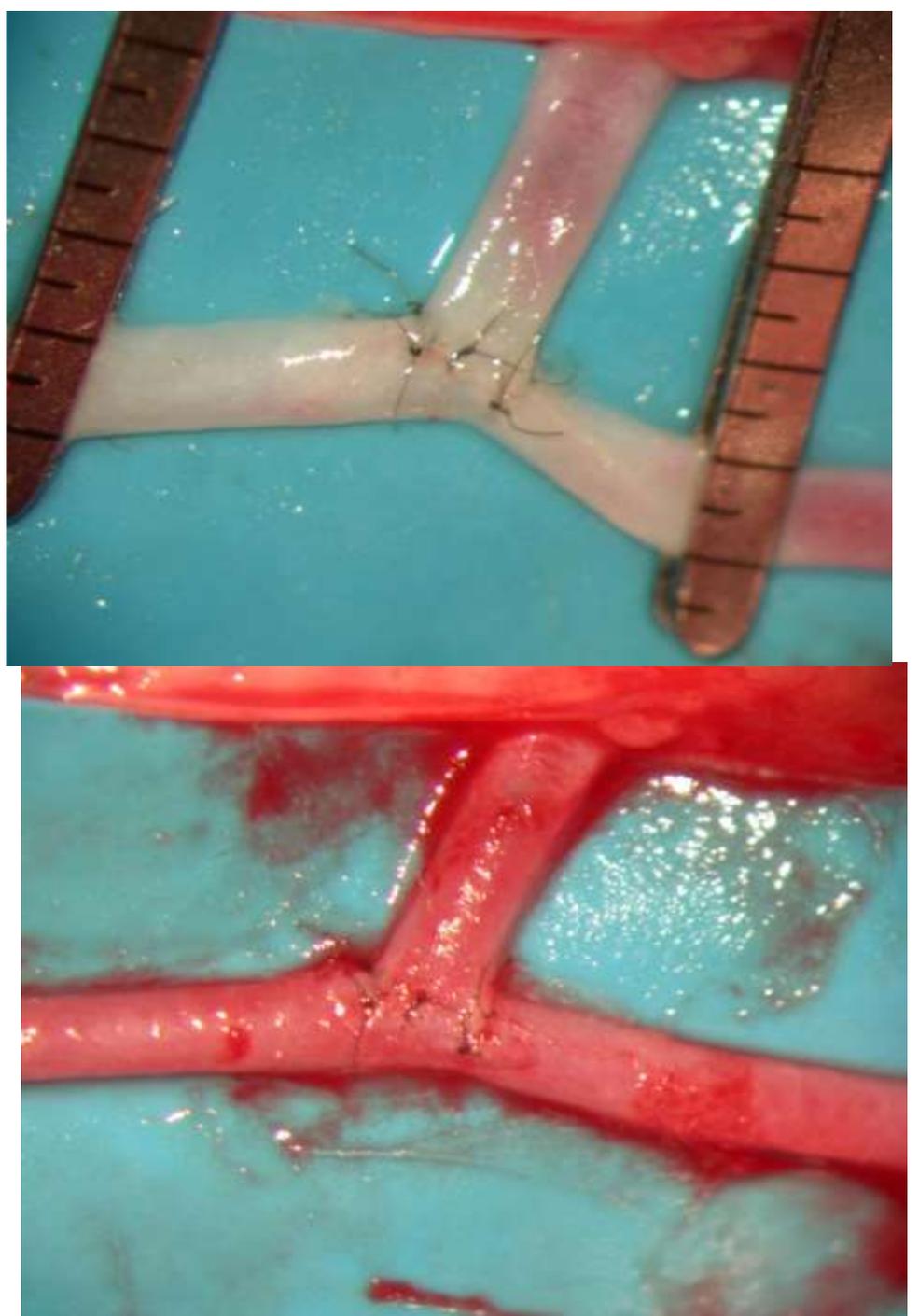
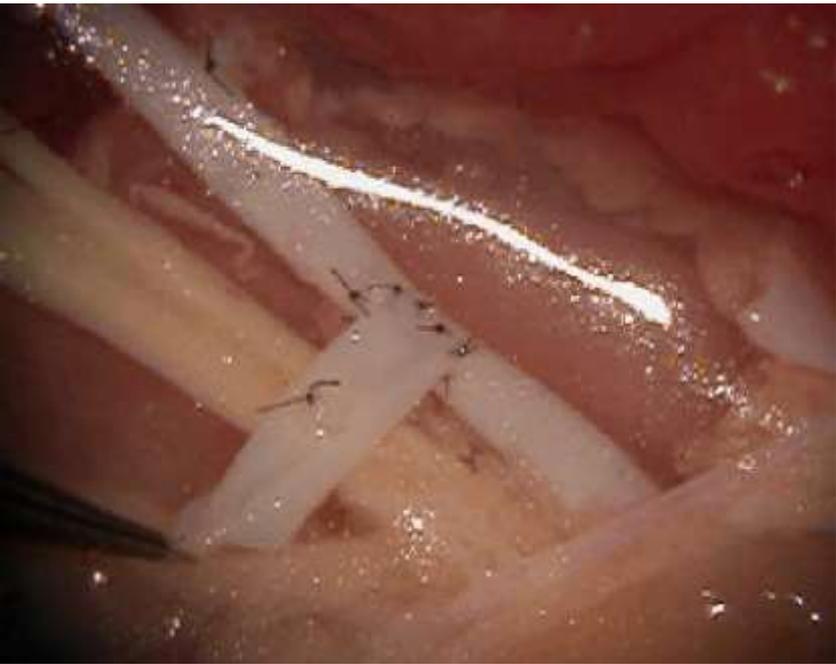
**Minimum requirement to pass to the next step :**

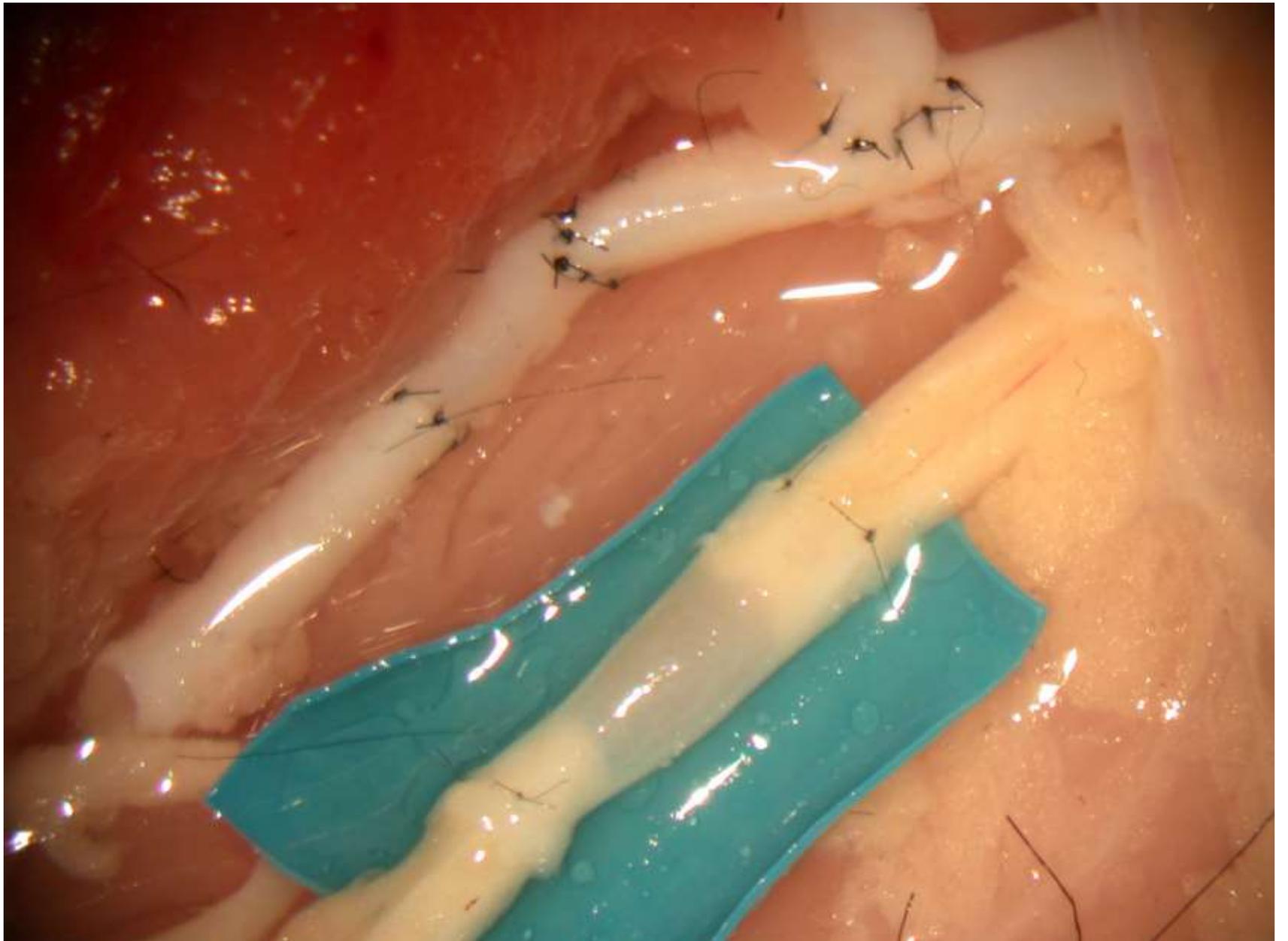
**The student can reach the next step when  
3 or 4 complete sutures have been  
accomplished.**





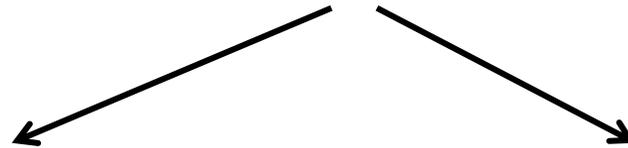






# 2nd TEN HOURS

## NEXT STEPS



10 more hours on chicken with different exercises (TL, vein grafting, nerve suture, muscle-in-vein etc)



Exercise on living model (eg. Rats)



# FINAL OBJECTIVE ASSESSMENT

	1	2	3	4	5
Time & motion	Many unnecessary moves		Efficient time/motion, but some unnecessary moves		Economy of movement and maximum efficiency
Instrument handling	Repeatedly makes tentative or awkward moves with instruments through inappropriate use		Competent use of instruments but occasionally appeared stiff or awkward		Fluid movement with instruments
Suture handling	Frequently damaged, broke or lost sutures		Occasionally damaged, broke or lost sutures		Sutures were consistently handled delicately under the control of operator
Tissue handling	Frequently used unnecessary force on tissue, caused damage inappropriate use of instruments		Careful handling of tissue, but occasionally caused inadvertent damage		Consistently handled tissue appropriately with minimal damage
Technical skill (anastomosis)	Poorly placed sutures and poor use of irrigation		Fair placement of suture and use of inappropriate use of irrigation		Well-placed sutures and appropriate use of irrigation
Flow of operation	Frequently stopped operating and seemed unsure of the next move		Demonstrated some forward planning, with reasonable progression of procedure		Obviously planned course of operation with effortless flow from one move to the next
Outcome (Patency)	Poor		Moderate, reduced flow		Excellent. Unimpeded flow

<b>GRS 3</b>						
<b>ID</b>	<b>Model</b>					
<b>Knot Tying</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Score</b>
<b>Quality of the knot</b>	Not square, loose, cut ends too long or too short		Partially square, somewhat loose, cut ends OK length		Square, snug, cut ends proper length	
<b>Efficiency</b>	Many wasted moves, regrasps multiple times, does not pull needle out of field		some waste moves, regrasps occasionally, sometimes pulls needle out of field		Not wasted moves, grasps once only, always pulls out of field	
<b>Handling</b>	Multiple passes, grasps tip of needle, does not bolster, pulls needle out on the curve		A few passes, sometimes grasps the tip, sometimes bolsters, sometimes pulls needle out on the curve		Single pass, never grasps the tip, always bolsters, always pulls needle out on the curve	
<b>Anastomosis</b>						
<b>Preparation</b>	Forgets background, Ends set up poorly in approximating clamp, forgets dilatation, no adventitial stripping		Rough dilatation, Excessive OR inadequate adventitial stripping		Background in place, approximating clamp applied correctly, gentle dilatation, clean adventitial stripping	
<b>Suturing</b>	Inaccurate needle placement, pulls needle through roughly, drops suture end OR inefficient knot tying, does not look inside lumen		Outer appearance inconsistent Or partially inverted, possible back wall stitch, suture ends intraluminal, suture spacing inconsistent		Smooth outer appearance, no back wall stitch, patent, all suture ends extraluminal, appropriate suture spacing	
<b>Total Score</b>						

### A. PREPARATION



Forgets background				Background in place
Ends set up poorly in approximating clamp			Approximating clamp applied correctly	
Forgets dilatation		Rough dilatation		Gentle dilatation
No adventitial stripping		Excessive/inadequate adventitial stripping		Clean adventitial stripping

### B. SUTURING

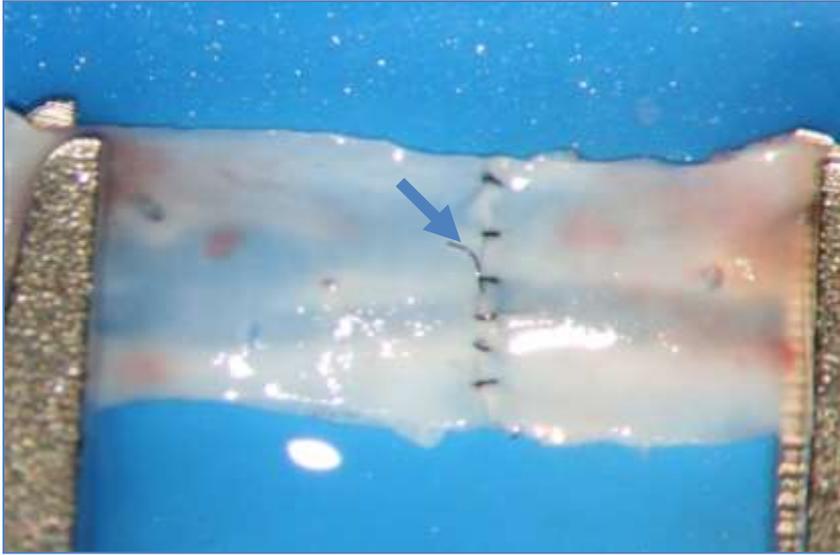


Inaccurate needle placement		Inconsistent needle placement		Accurate needle placement
Pulls needle through roughly		Rough/inconsistent needle passage		Takes needle out on curve
Drops suture end/inefficient knot tying		Knot tying loose/tight/inefficient		Efficient tying
Does not look inside lumen				Always checks inside lumen
Too much movement at anastomosis with tying				Anastomosis stays still with tying

### C. FINAL PRODUCT

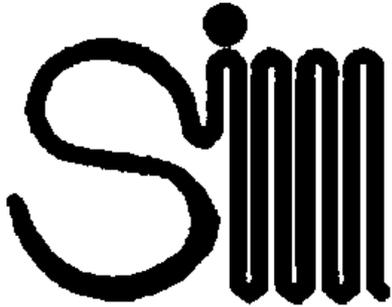


Rough outer appearance		Outer appearance inconsistent/partially inverted		Smooth outer appearance
Back wall stitch		Possible back wall stitch		No back wall stitch
Not patent				Patent
Suture ends intraluminal		Some suture ends intraluminal		All suture ends extraluminal
Poor suture spacing		Suture spacing inconsistent		Appropriate suture spacing



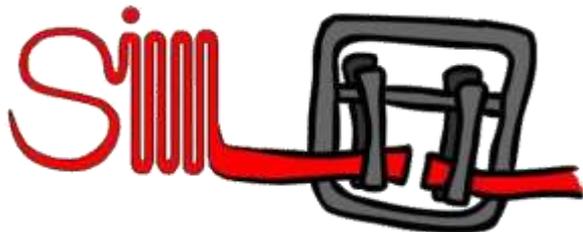
# ITALIAN SOCIETY FOR MICROSURGERY

## Basic microsurgical course standardization



**11 centers**

**University and Hospital**



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