

# SLING on a STRING

*Workshops in Pelvic Surgery, London, 22-26 June 2009*



LEWIS LANDER

# Objectives

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- ❑ To demonstrate the operative procedure for the insertion of an autologous rectus sling.
- ❑ To outline the indications, complications and outcomes of the procedure.
- ❑ To show the fate of the rectus fascia graft

# Indications

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- Repeat and salvage procedures for recurrent stress incontinence
- Intrinsic sphincter deficiency
- Primary procedures in hyperallergenic individuals
- Primary procedures in the young woman

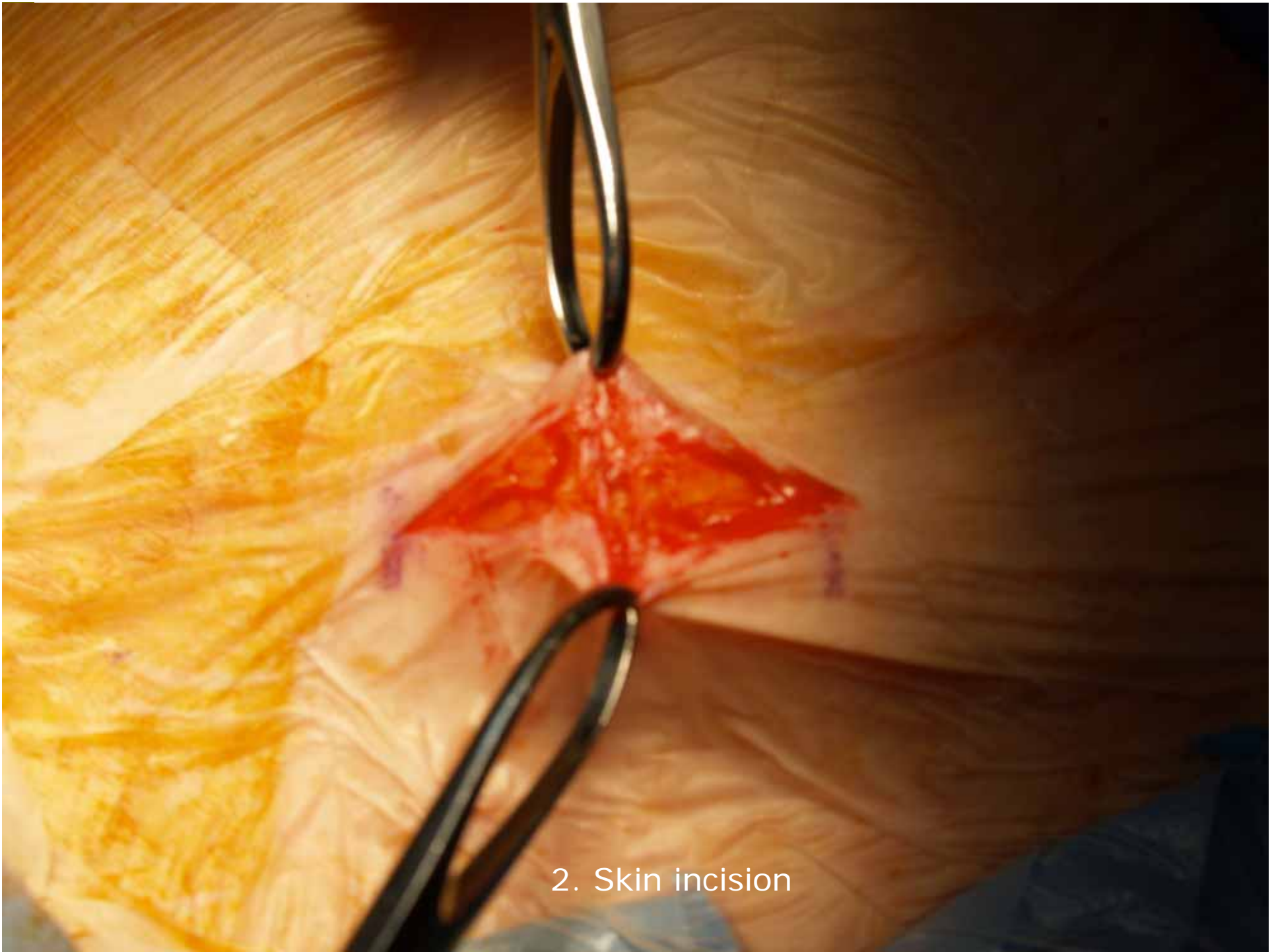
# Autologous Sling Procedure

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- ▣ A harvested strip of rectus fascia is placed transvaginally at the level of the proximal urethra.
- ▣ The fascial strip is secured superiorly to the rectus fascia with permanent sutures.



1. 5cm incision marked 3cm above symphysis pubis



2. Skin incision



Intact rectus sheath exposed & cleaned without damage



5cmx2cm template inserted into wound



Diathermy excision of rectus sheath strip



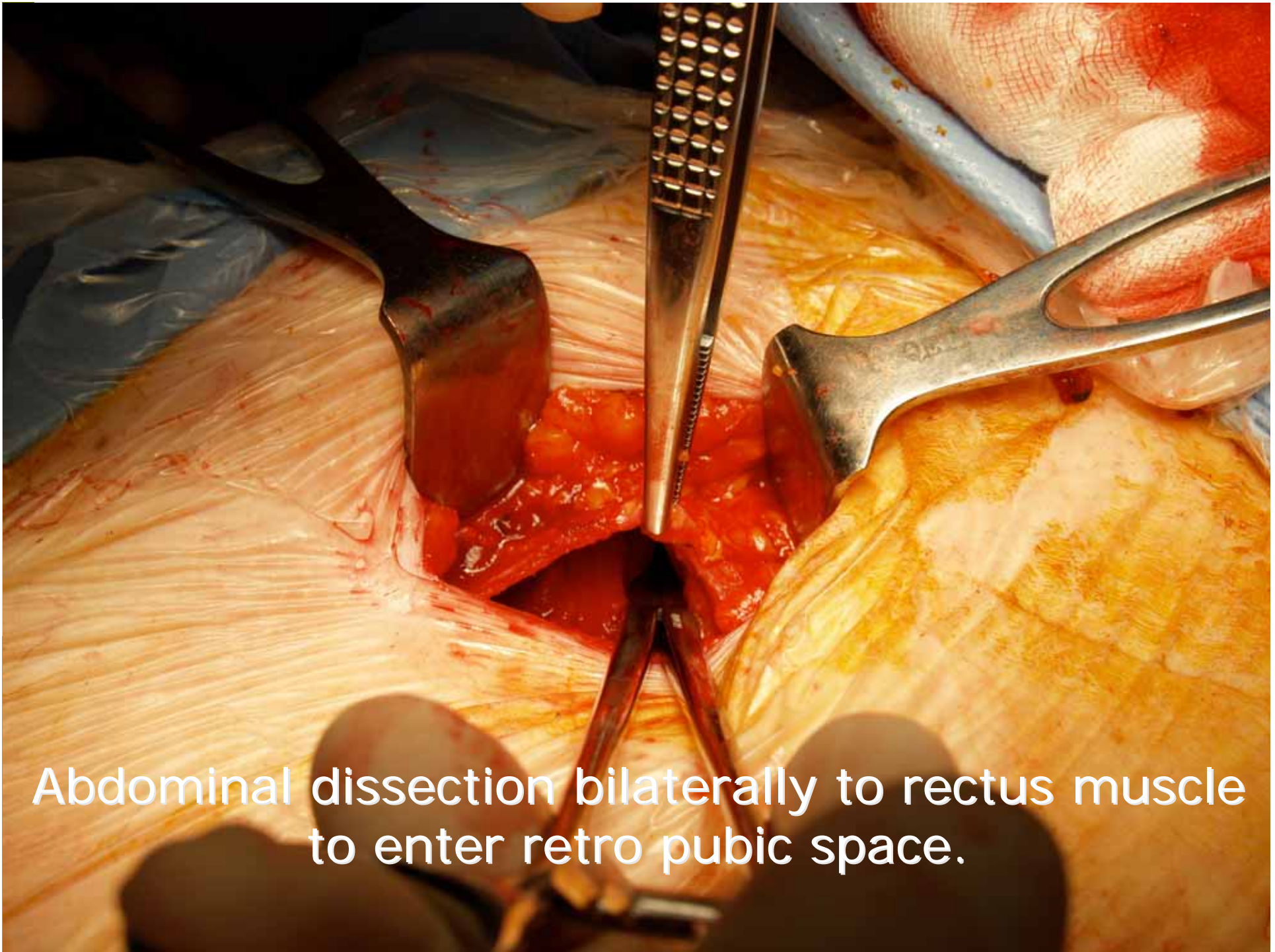
Rectus sheath strip excised from underlying fat and rectus muscle



Harvested 5cmx2cm rectus sheath sling



\*1 or \*0 nylon suture inserted into ends of rectus sheath sling with cleaned smooth surface to face urethra. Sheath wrapped in saline soaks.



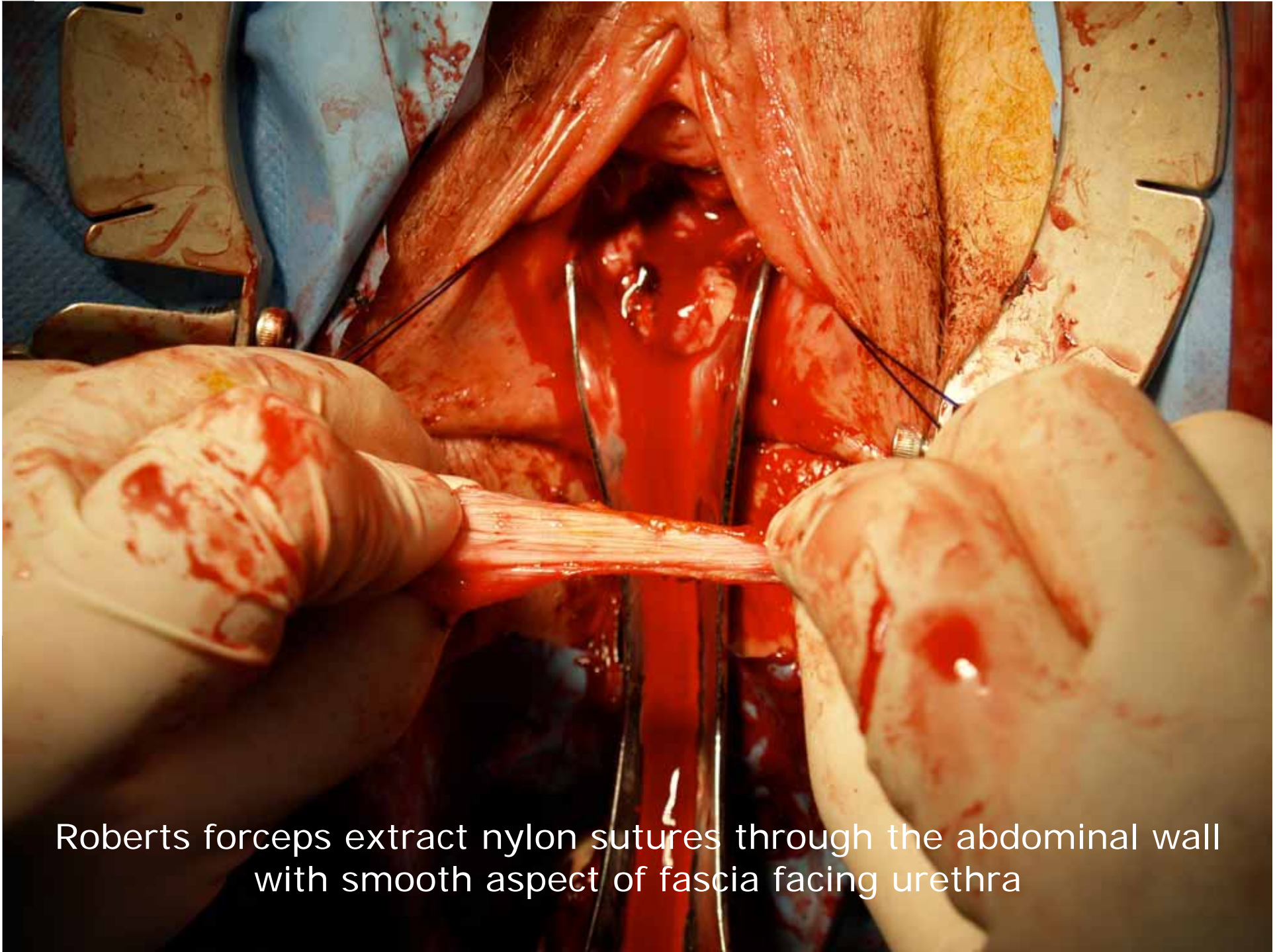
Abdominal dissection bilaterally to rectus muscle to enter retro pubic space.



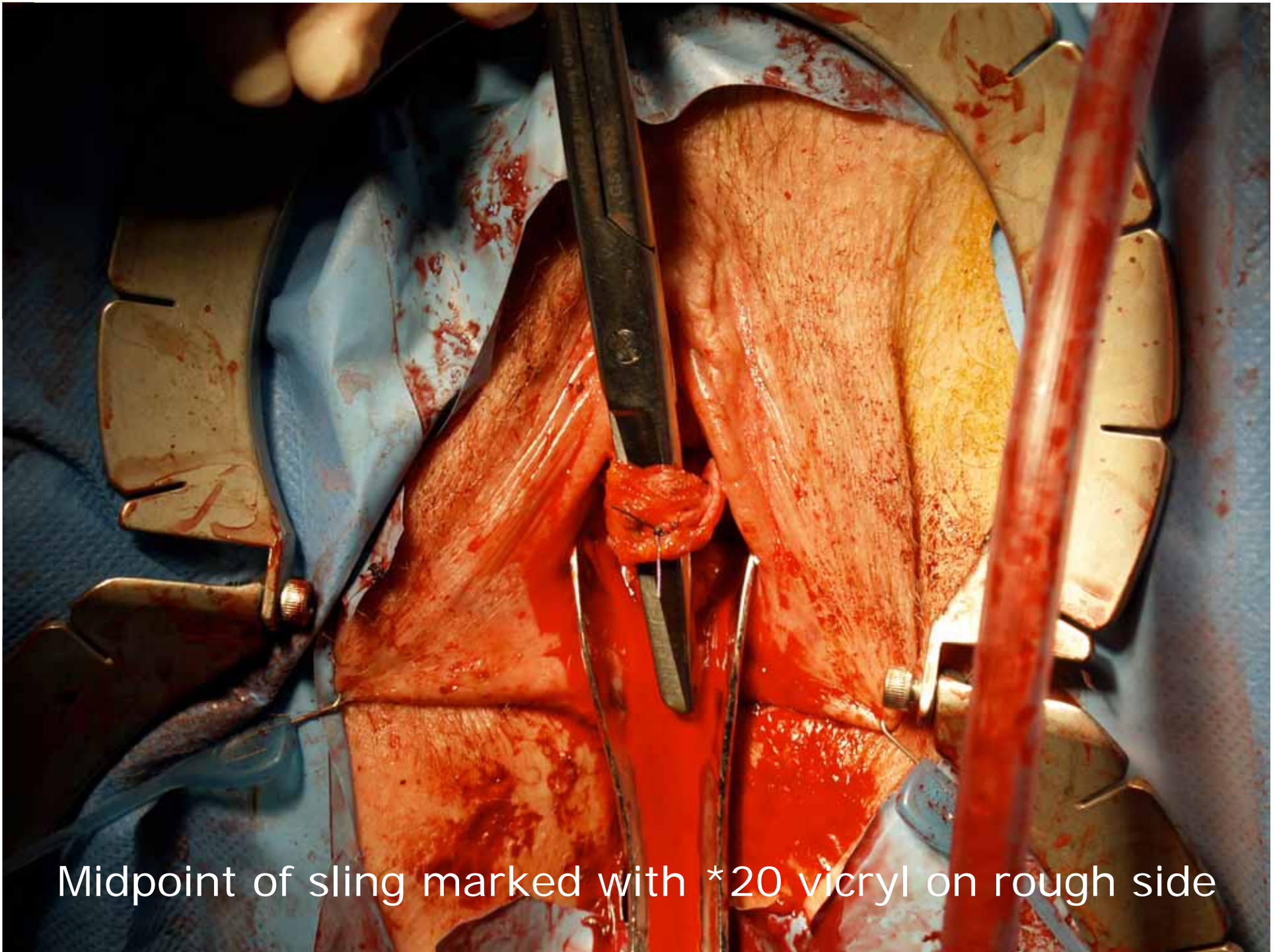
Roberts forceps hug posterior surface of symphysis exiting alongside the urethra.



Cystoscopy to exclude inadvertent cystotomy



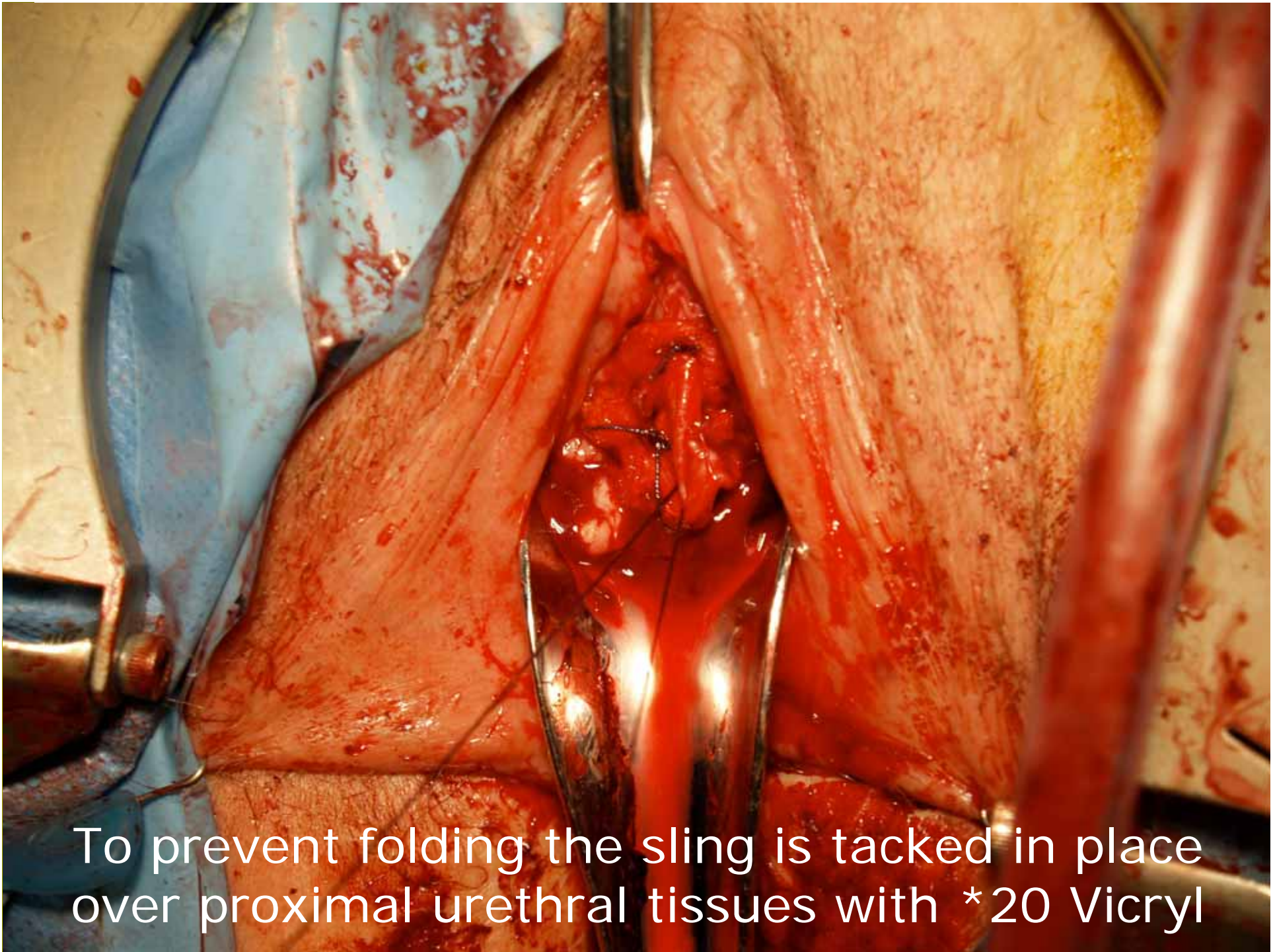
Roberts forceps extract nylon sutures through the abdominal wall with smooth aspect of fascia facing urethra



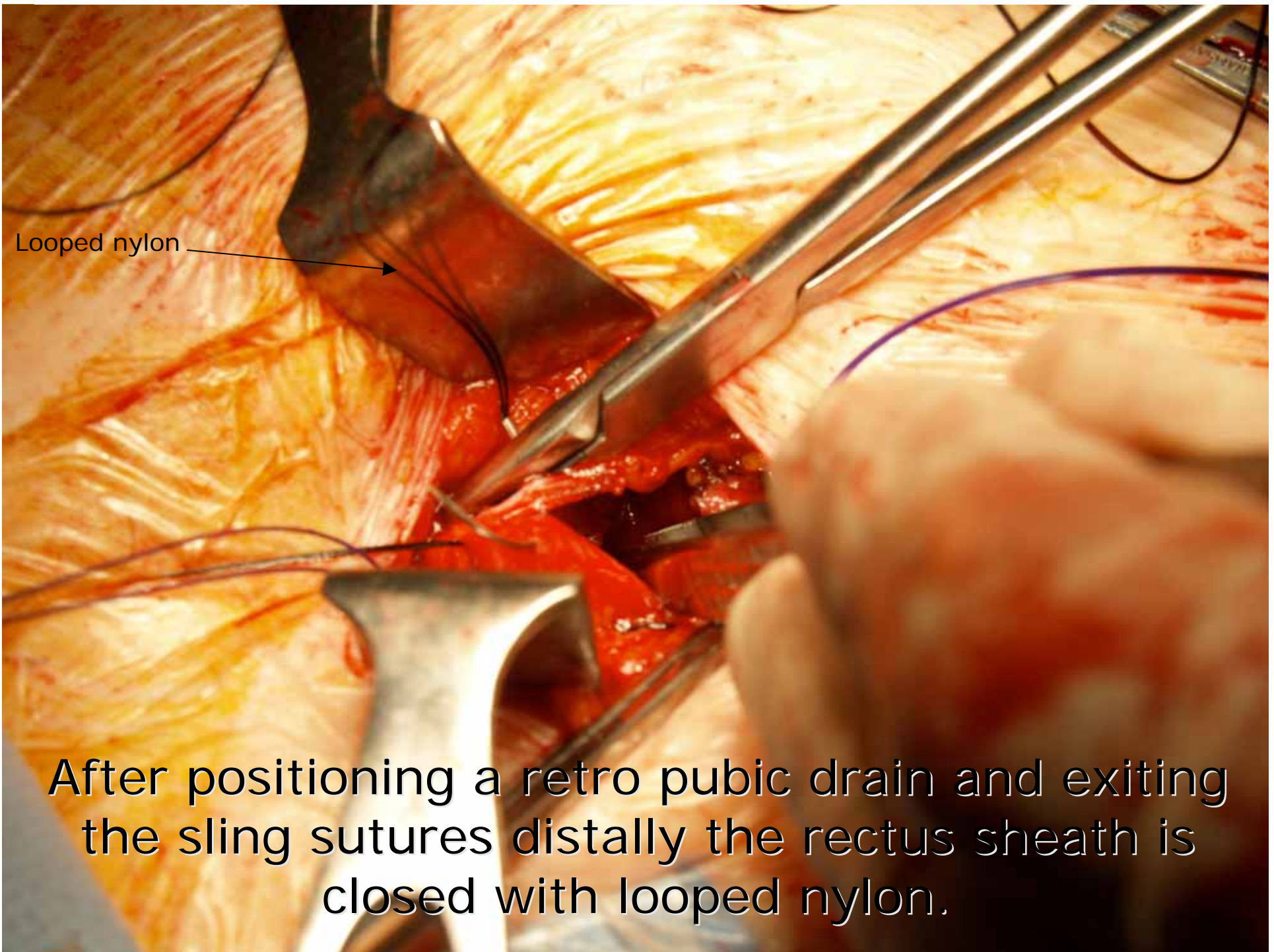
Midpoint of sling marked with \*20 vicryl on rough side



Nylon sutures pulled through recti with smooth surface facing urethra



To prevent folding the sling is tacked in place over proximal urethral tissues with \*20 Vicryl



Looped nylon

After positioning a retro pubic drain and exiting the sling sutures distally the rectus sheath is closed with looped nylon.

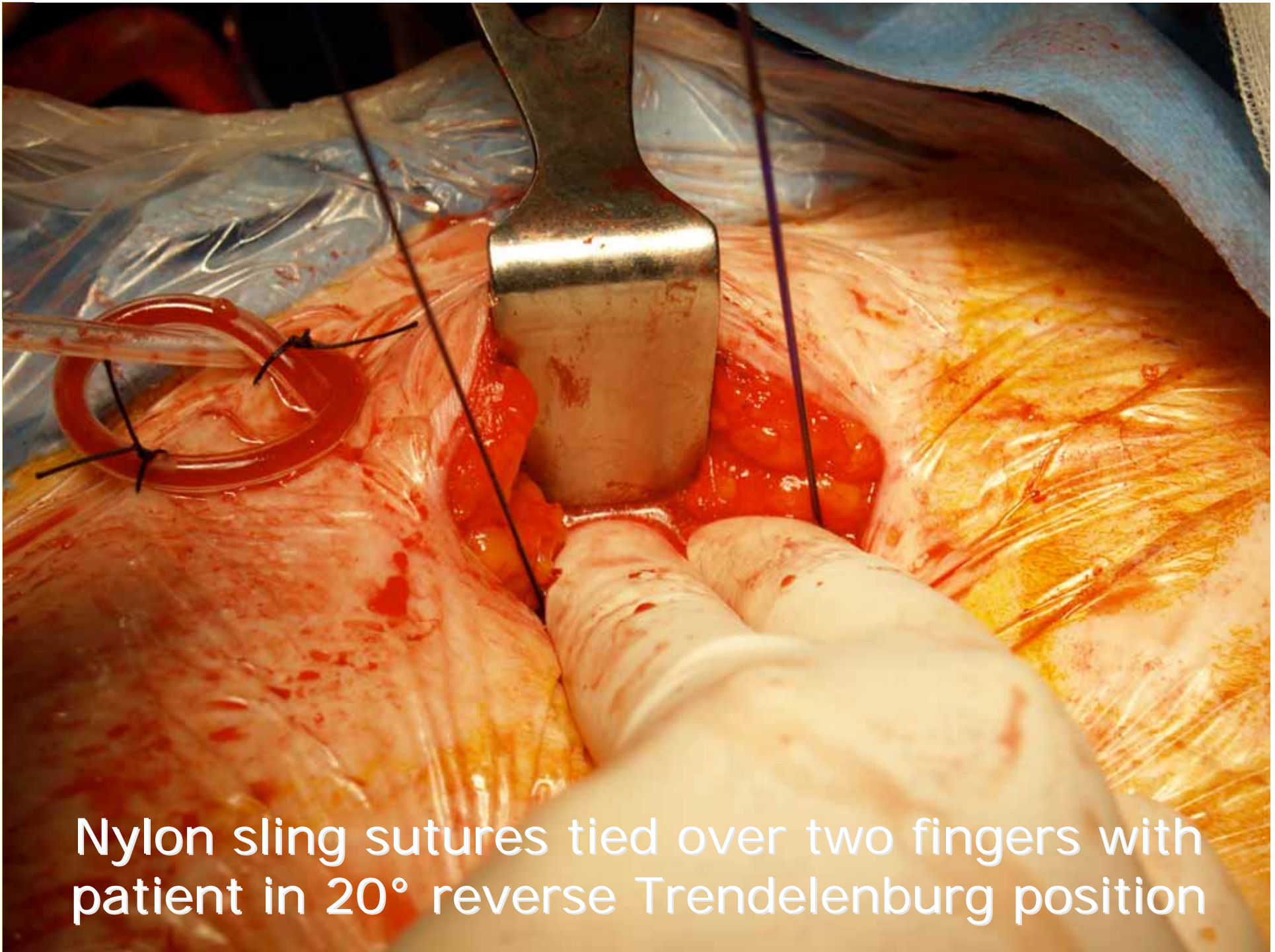


The sling is now ready for tensioning

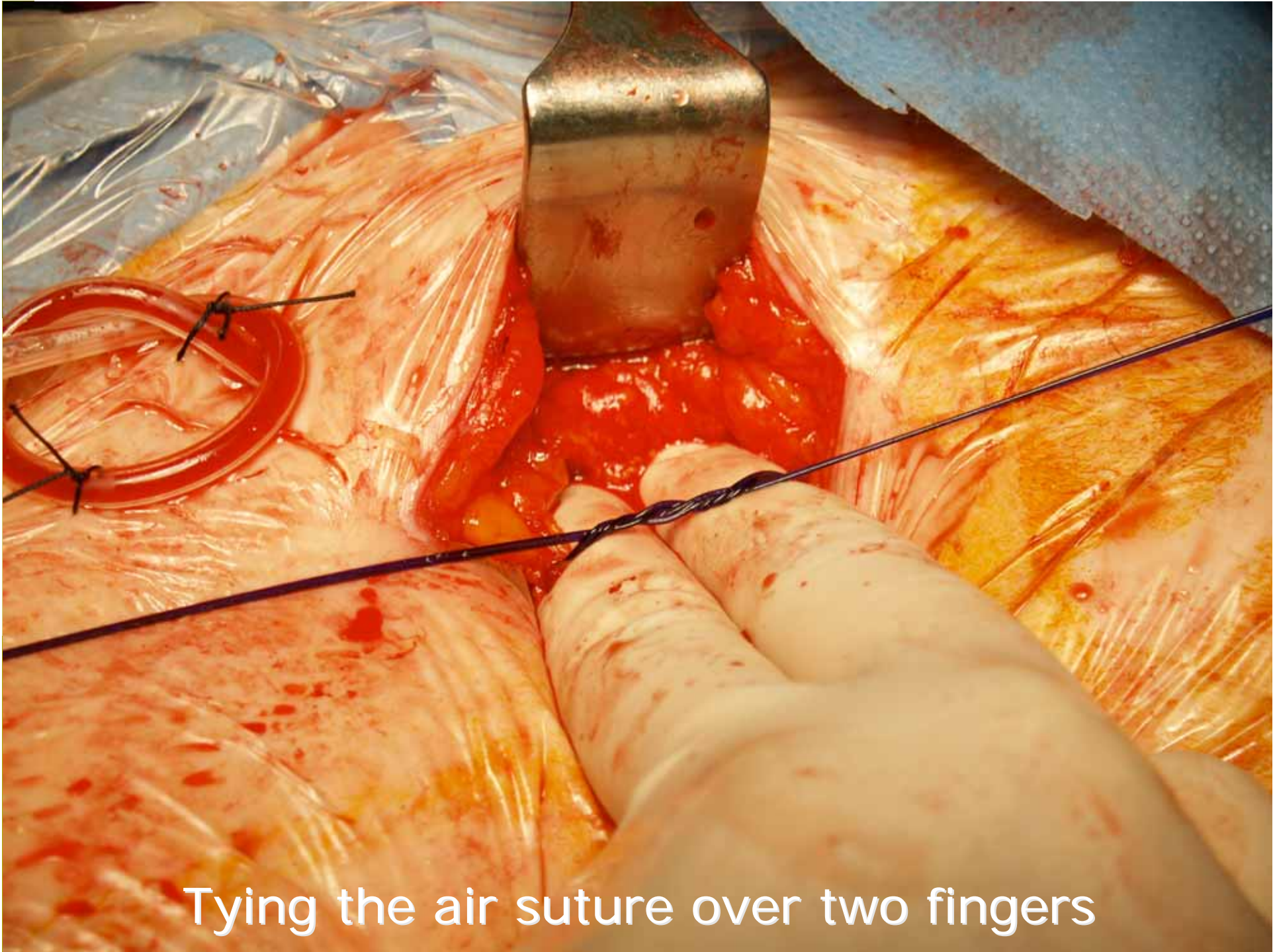


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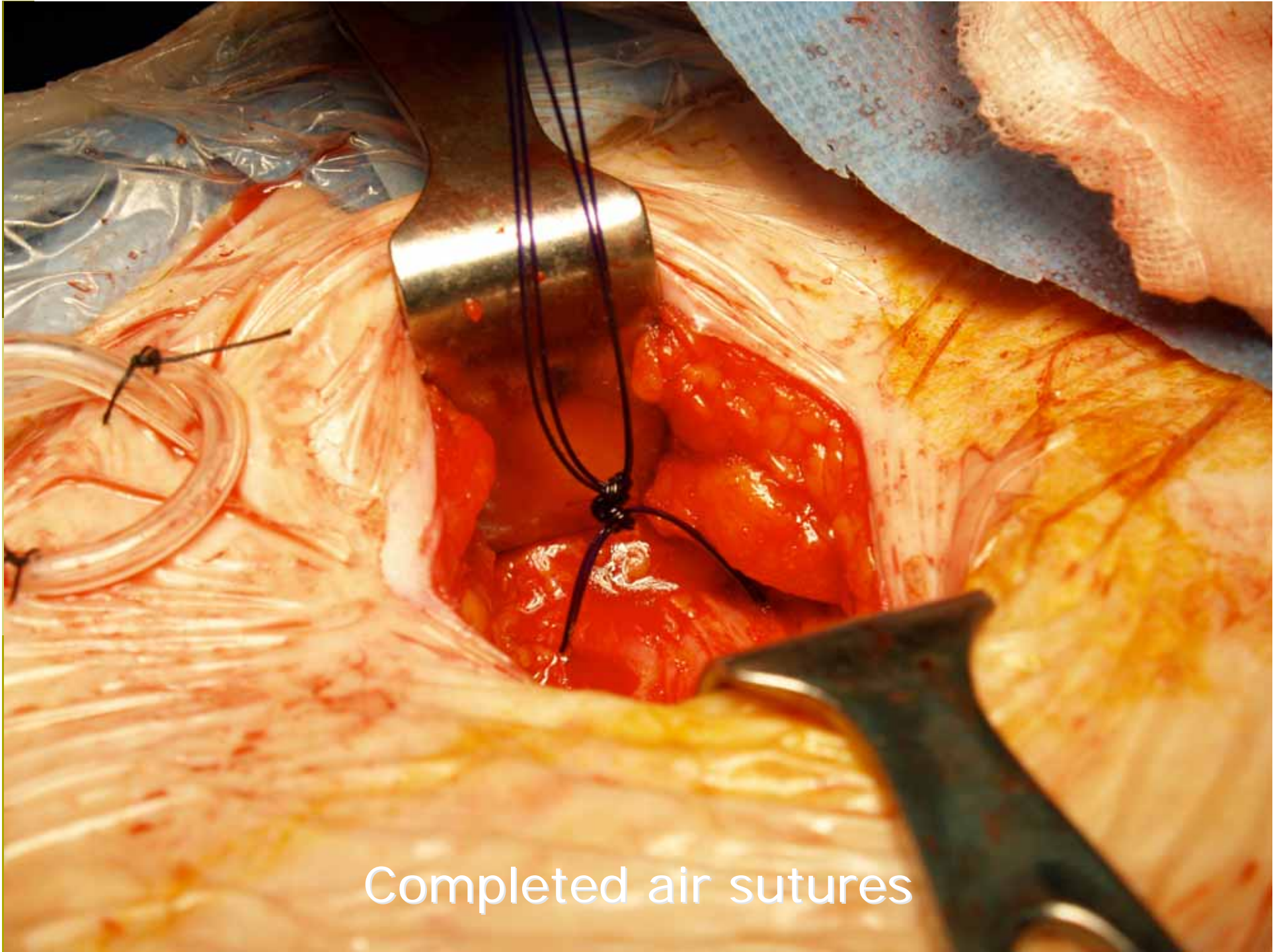
Prior to tensioning the sling suture the patient is placed in a  $>20^\circ$  reverse Trendelenburg position.



Nylon sling sutures tied over two fingers with patient in 20° reverse Trendelenburg position



Tying the air suture over two fingers



Completed air sutures



5cm abdominal wound



**Abdominal wound closed with clips removed  
in 48 hours with Steristrip support**



Vaginal epithelium closed with \*20 Vicryl

# Complications

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- ❑ **Obstructive:**
  - recurrent UTI**
  - voiding dysfunction**
  - urge incontinence**
- ❑ **Wound complications**
- ❑ **Hemorrhage**
- ❑ **Incidental cystotomy**
- ❑ **Pelvic pain**
- ❑ **Erosion of suture into bladder**
- ❑ **Ventral hernia**

# OUTCOMES

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- ❑ Objective Cure Rates of 80 to 90% with good durability Cochrane Database(2005) Syst Rev(3):CD001754
- ❑ Patient Satisfaction – 73% initially claim good quality of life decreasing with longer follow up Chaikin DC et al J Urol 160(4):1312-1316
- ❑ Urodynamic Parameters show dissatisfaction is based on storage problems mainly urge and urge incontinence associated with bladder outlet obstruction  
Gustavo L et al Int Urogynecol J (2009)20:201-205

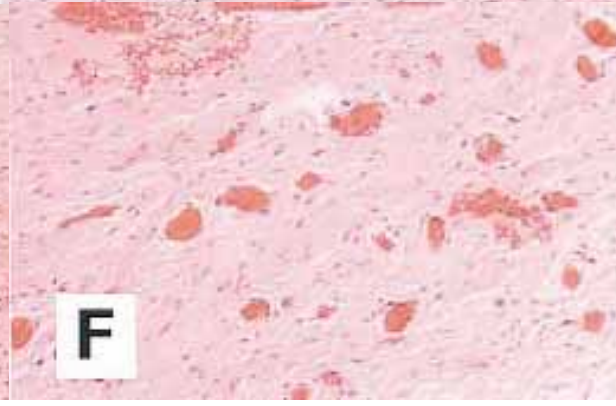
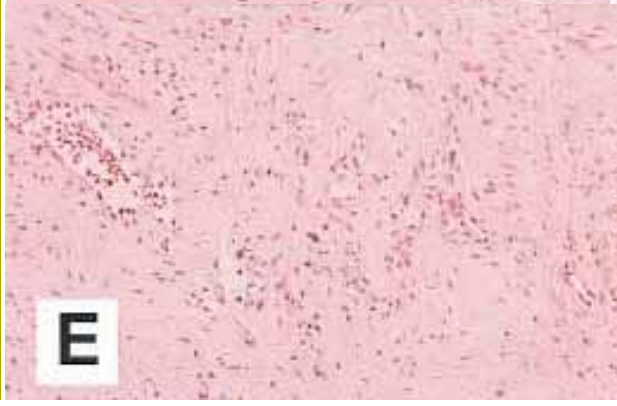
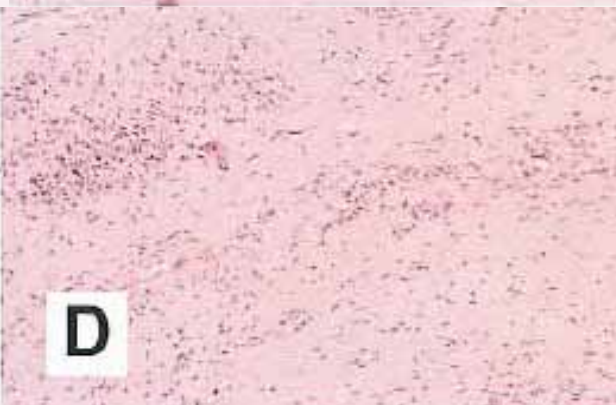
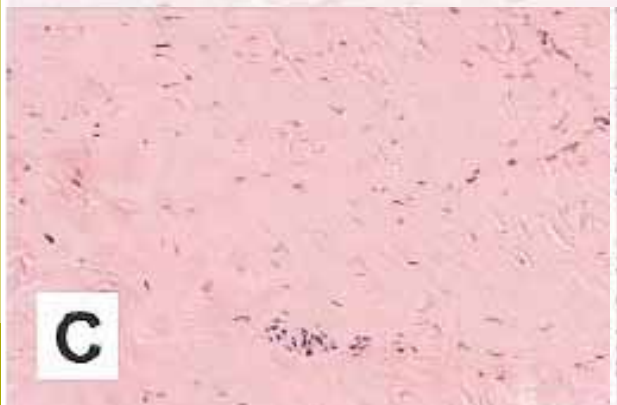
# Fate of Rectus Fascia

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- ❑ Fibroblast proliferation, neovascularization and extensive graft remodelling occurs.
- ❑ There is no inflammatory reaction nor graft degeneration.
- ❑ Fibroblast proliferation with linear orientation of connective tissue and fibroblasts affords some tensile strength to the sling.

Fitzgerald MP et al Am J Obstet Gynecol 2000 183,4;964-6

# Fate of Rectus Fascia



👉👉 Normal rectus fascia

👉👉 Rectus sling 3 weeks post implantation

👍👉 Rectus sling 5 weeks post implantation

👉👉 Rectus sling 8 weeks post implantation

👉👉 Rectus sling 17 weeks post implantation

👉👉 Rectus sling 4 years post implantation

# Rectus Fascia Pre Implantation



- **Connective tissue fibres run parallel to each other**
- **Fibroblasts are parallel to connective tissue fibres**
- **Low ratio of cells to connective tissue**

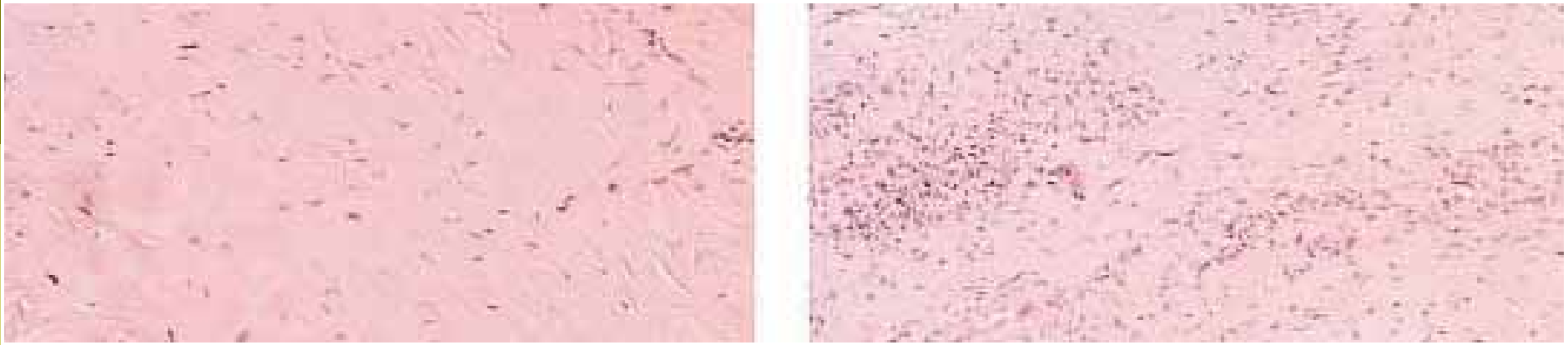
# Rectus Fascia 3 weeks Post Implantation



- **Proliferation of fibroblasts: Fibroblasts > Connective tissue**
- **Fibroblasts align along stress lines**
- **No acute inflammatory reaction nor evidence of degeneration**
- **Active remodelling occurs**

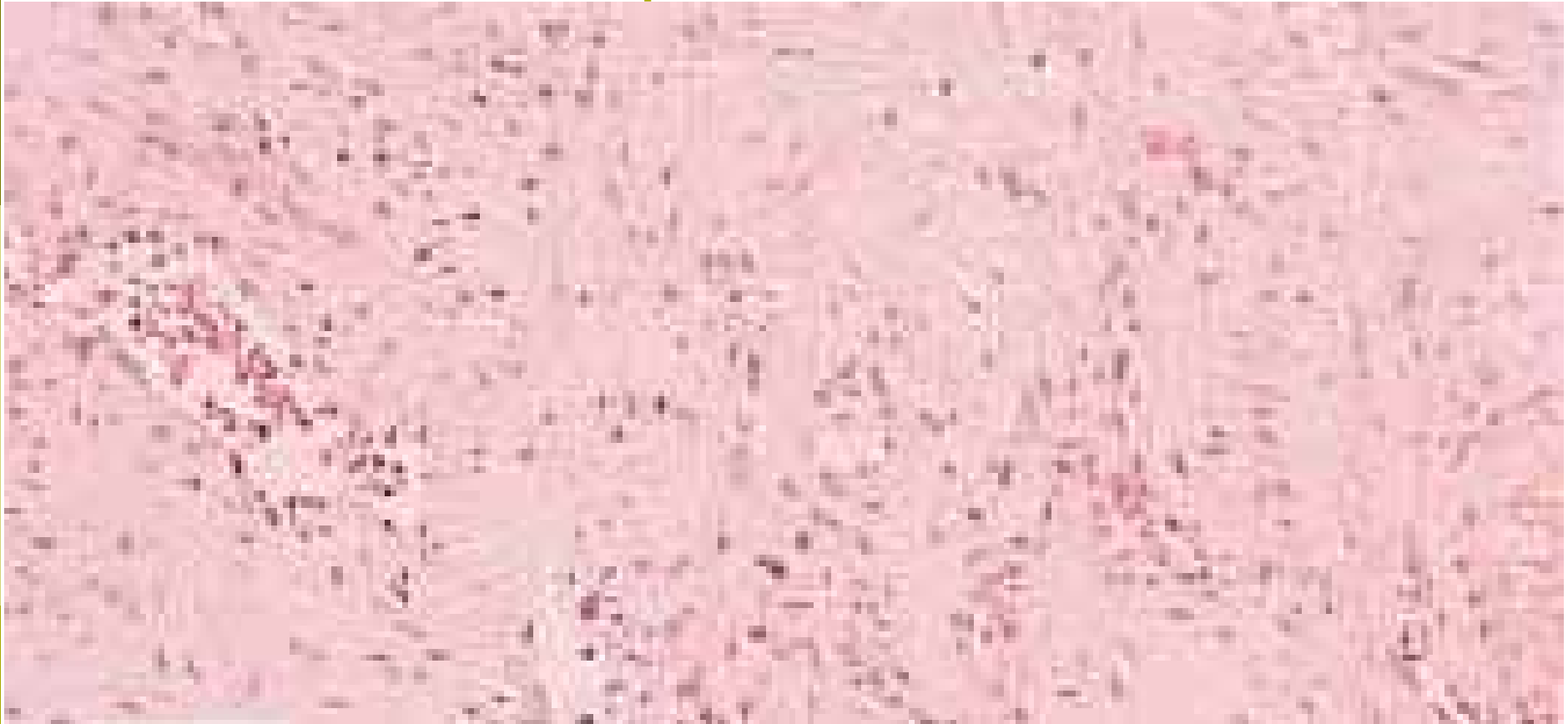
# Rectus Fascia 5 & 8 Weeks Post Implantation

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- Fibroblasts progressively increase
- Extensive neovascularization occurs
- Active remodelling continues

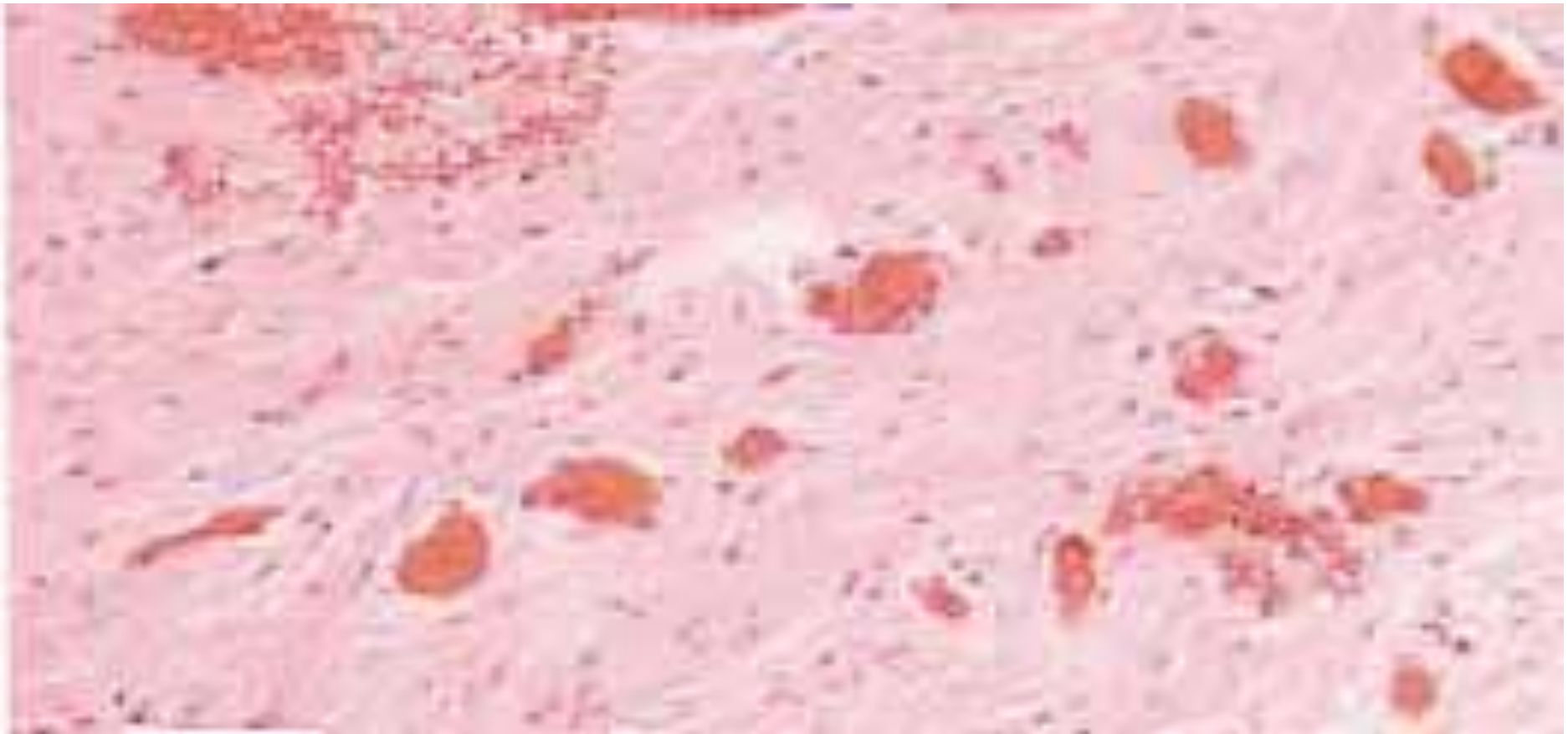
# Rectus Fascia 17 Weeks Post Implantation



- **High cell to fibre ratio persists**
- **Extracellular fibres arranged in compact parallel bundles with interspersed fibroblasts**
- **Some areas similar to scar tissue without an inflammatory reaction**

# Rectus Fascia 4 Years Post Implantation






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- **Marked increase in vascularity**
- **Connective tissue fibres arranged longitudinally suggesting some tensile strength**

# Summary

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-  **Shrinkage occurs at all stages**
-  **Linear orientation of connective tissue and fibroblasts mixed with non inflammatory scar tissue occurs**
-  **Grafts do not have appearance of structure with good tensile strength such as a ligament**
-  **Grafts appear to function clinically with adequate tensile strength for the physiological role**
-  **Successful remodelling depends on correct tensioning of the sling**



# WORKSHOPS IN PELVIC SURGERY