

Management of Presacral Bleeding During Rectal Dissection

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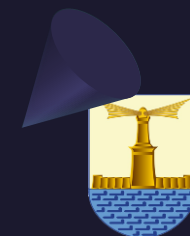
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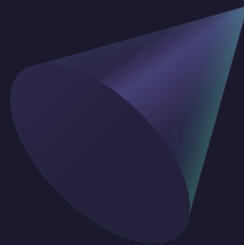
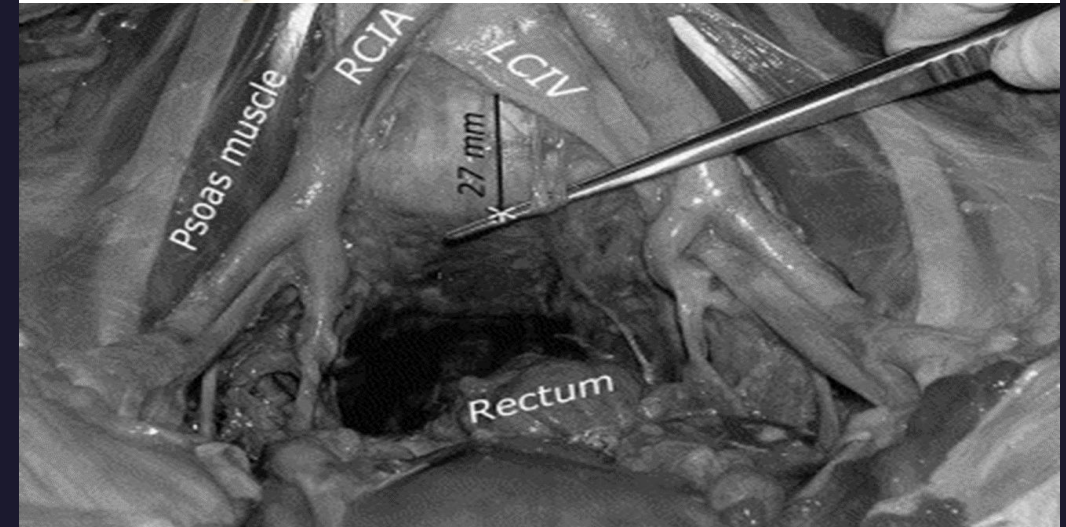
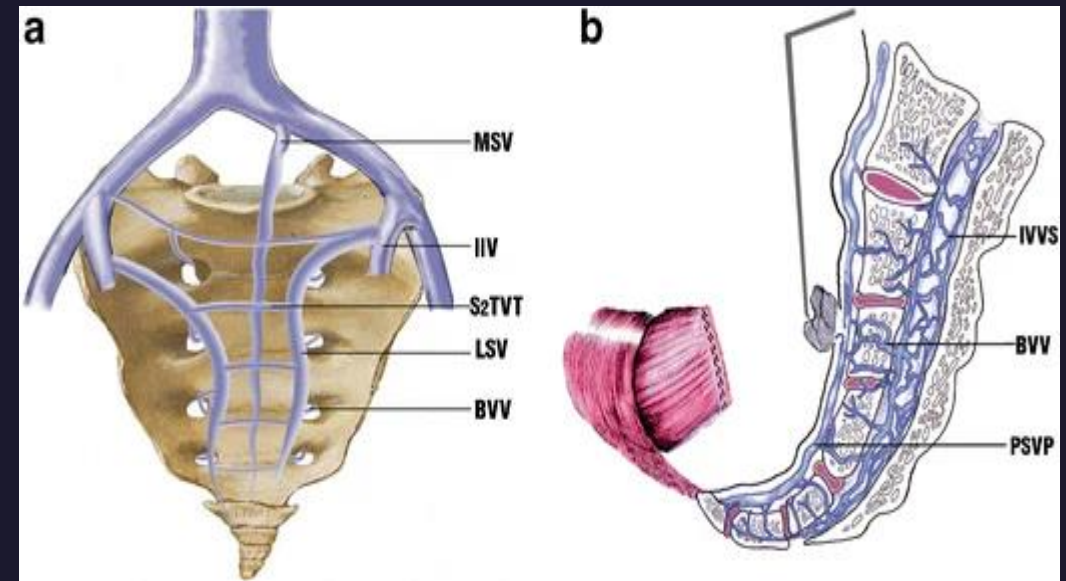
Disclosures

- Speaker and trainer for Medtronic
- Consultant for Touch Stone
- Speaker for Sanofi pharmaceutical

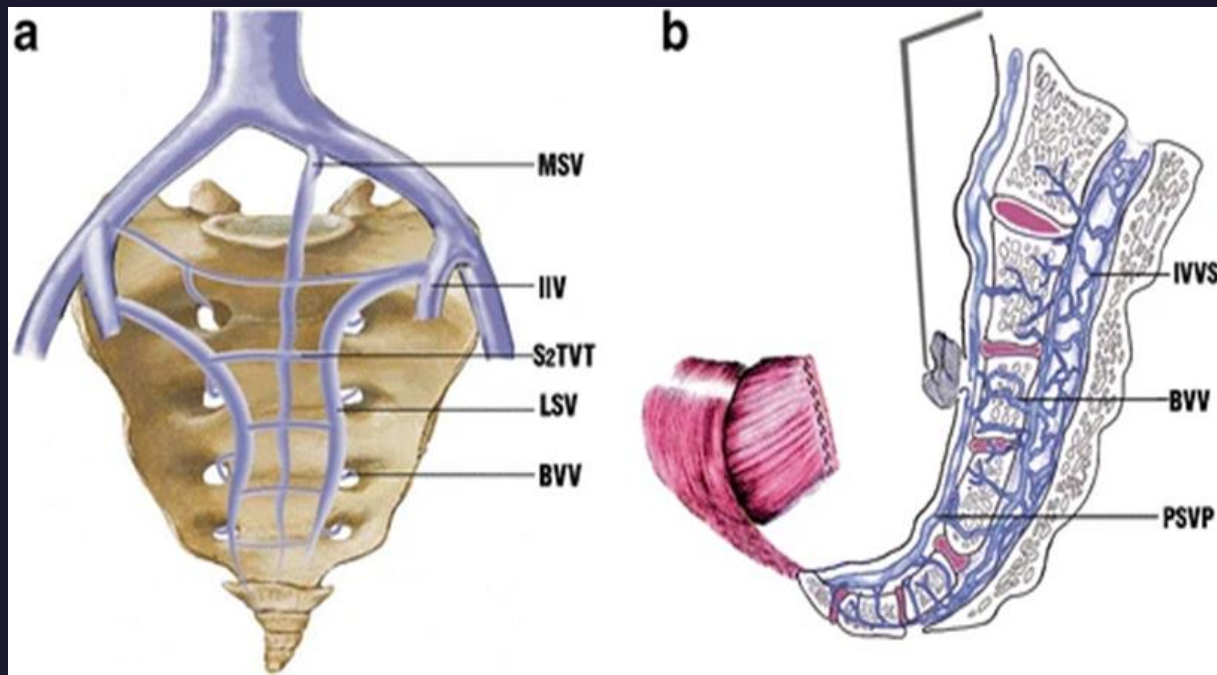


Presacral Bleeding

- Catastrophic complication during pelvic surgery
- The vasculature of the presacral space may deviate considerably from expected locations, making careful navigation of this space imperative

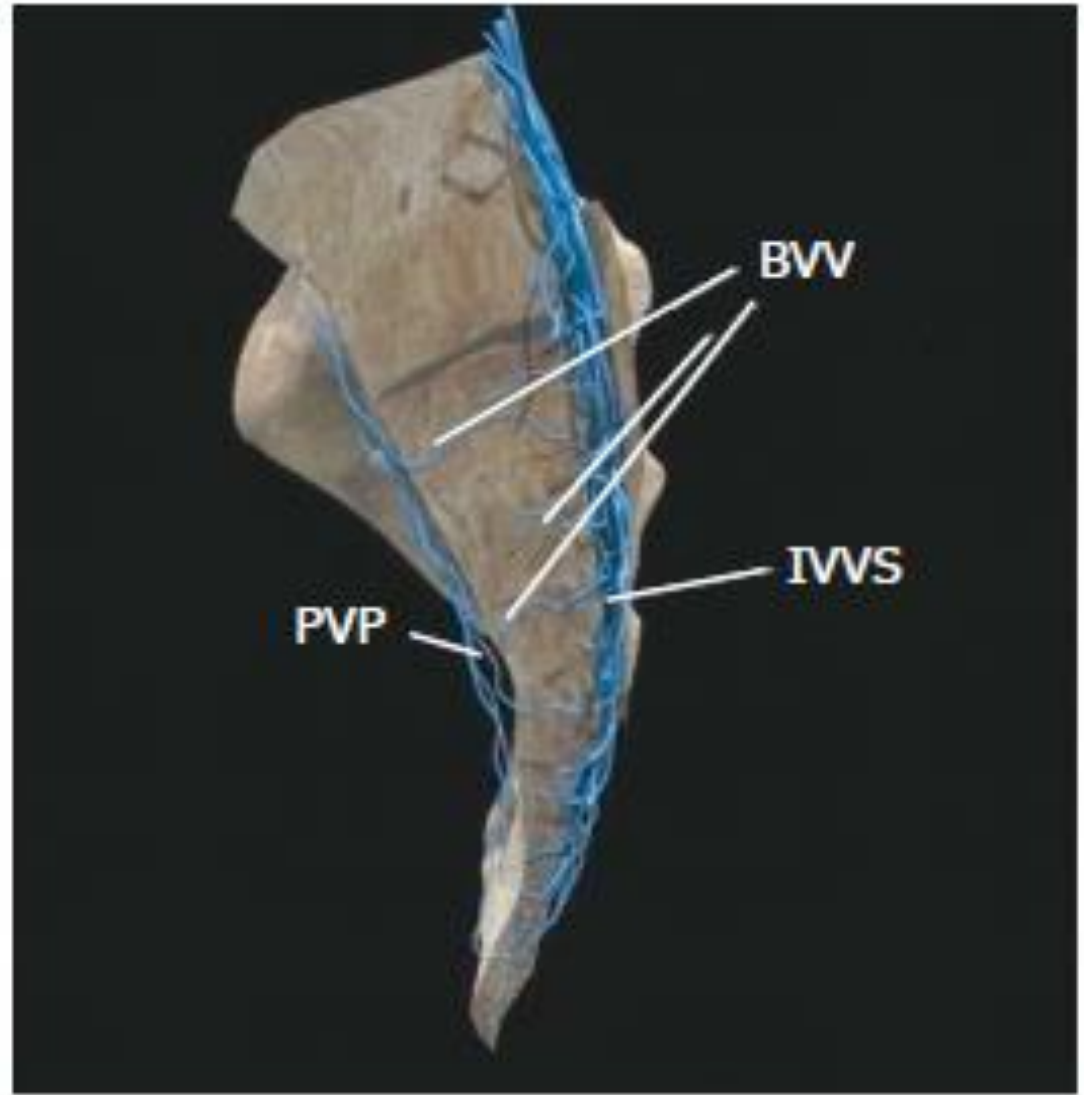
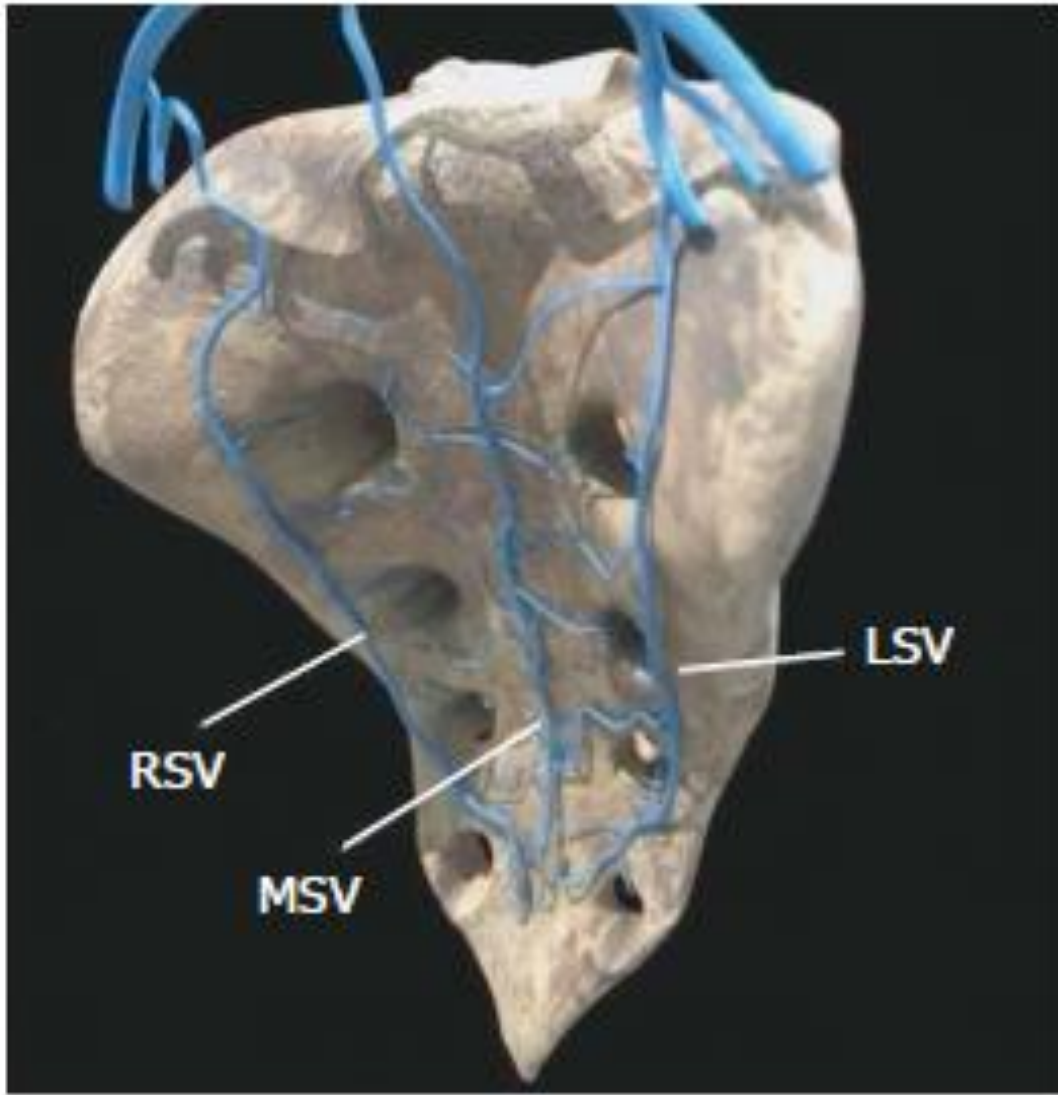


Anatomical considerations



- Wide and intricate network of veins primarily formed by the anastomosis between the medial and lateral sacral veins.
- The medial sacral vein usually drains into the left common iliac vein, whereas the lateral veins drain into the internal iliac vein.
- The SVP receives contributions from the lumbar veins of the posterior abdominal wall and the basivertebral veins that pass through the sacral foramen





Anatomical considerations



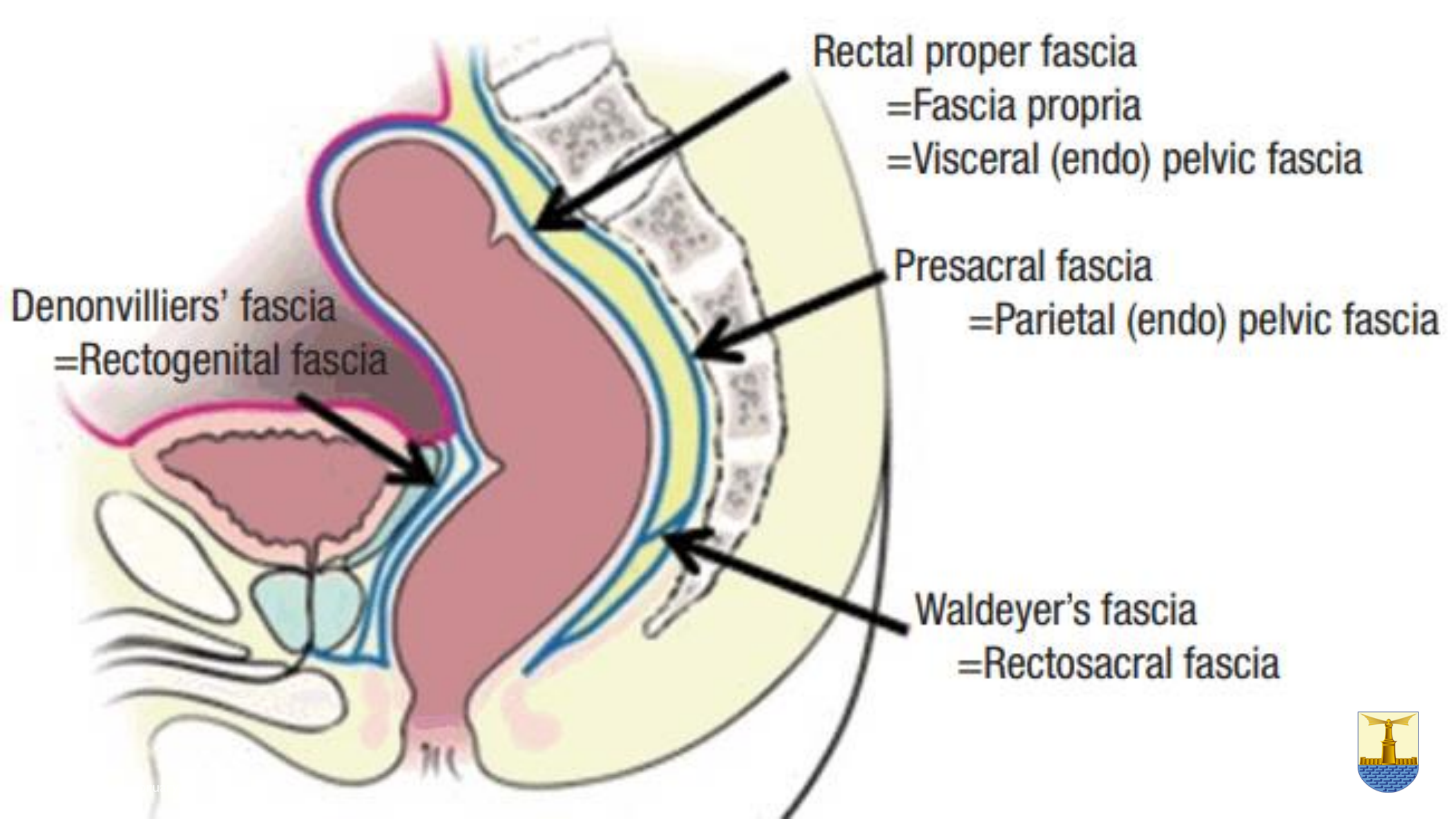
- 100% of the sacral bone specimens feature foramina that communicate with the anterior sacral face and the cancellous bone of the vertebral bodies
- Between 16% and 22% of these foramina are 2 to 5 mm in diameter, are located on the anterior face of S₄-S₅, and are penetrated by basi-vertebral veins, measures between 0.7 mm and 1.5 mm in this region



Anatomical considerations

- Waldeyer's fascia, is a sheet of connective tissue that extends from the periosteum of the sacrum to the posterior wall of the rectum 3-4 cm above the anorectal junction.





Causes of injury

- Risk factors that influence the incidence of presacral bleeding
 - Height of the tumor in the rectum
 - Infiltration of the presacral fascia by the tumor
 - Use of adjuvant radiotherapy
 - Prior rectal surgery
 - Poor visualization of the surgical field
 - Presacral veins, can be lacerated by the surgeon due to inadequate dissection of the posterior wall of the rectum in the sacral concavity



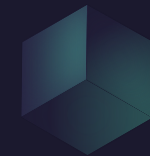
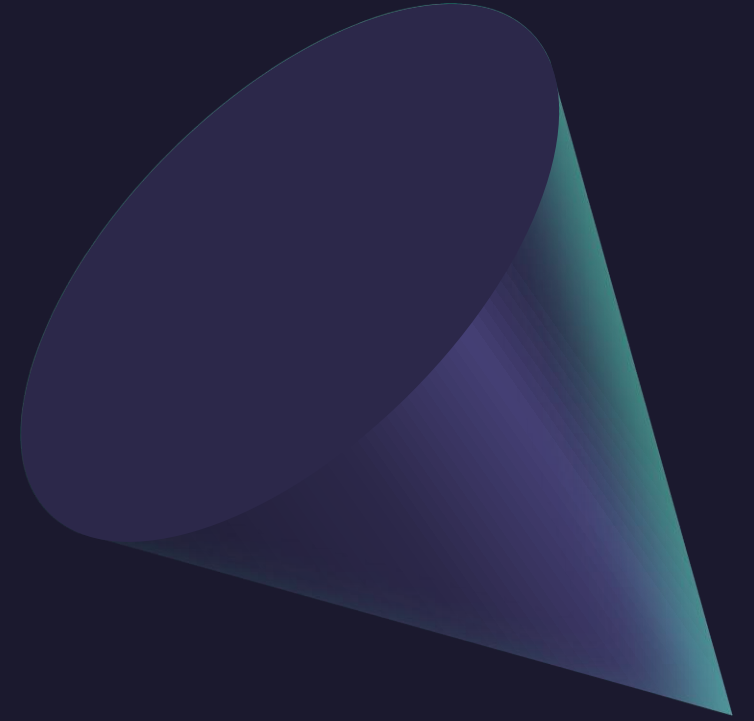
Causes of injury

- 3 types of venous injury
 - Injury to the presacral veins (type I)
 - Injury to the presacral veins and/or basivertebral veins of diameter < 2 mm (type II)
 - Injury to the presacral veins and/or basivertebral veins of diameter > 2 mm (type III)

Wang et al Arch Surg. 1985



Surgical management



Rules

- Calm down
- Inform anesthesiologist
- Apply compression for minutes and take a deep breath until everything is ready
- Have packed RBCs ready for possible transfusion
- Have good suction irrigation handy
- Ligature of the internal iliac artery is not effective and can cause gluteal and vesical necrosis, and ligation of the internal iliac vein makes venous drainage of its tributaries difficult, increases pressure on the sacral plexus, and exacerbates bleeding



Rules

There is limited evidence in the literature evaluating the effectiveness of different techniques, and it is typically expert opinion and experience

Surgeons should familiarize themselves with the products available at their institutions in the event that presacral bleeding is encountered

The techniques can be used in no particular order

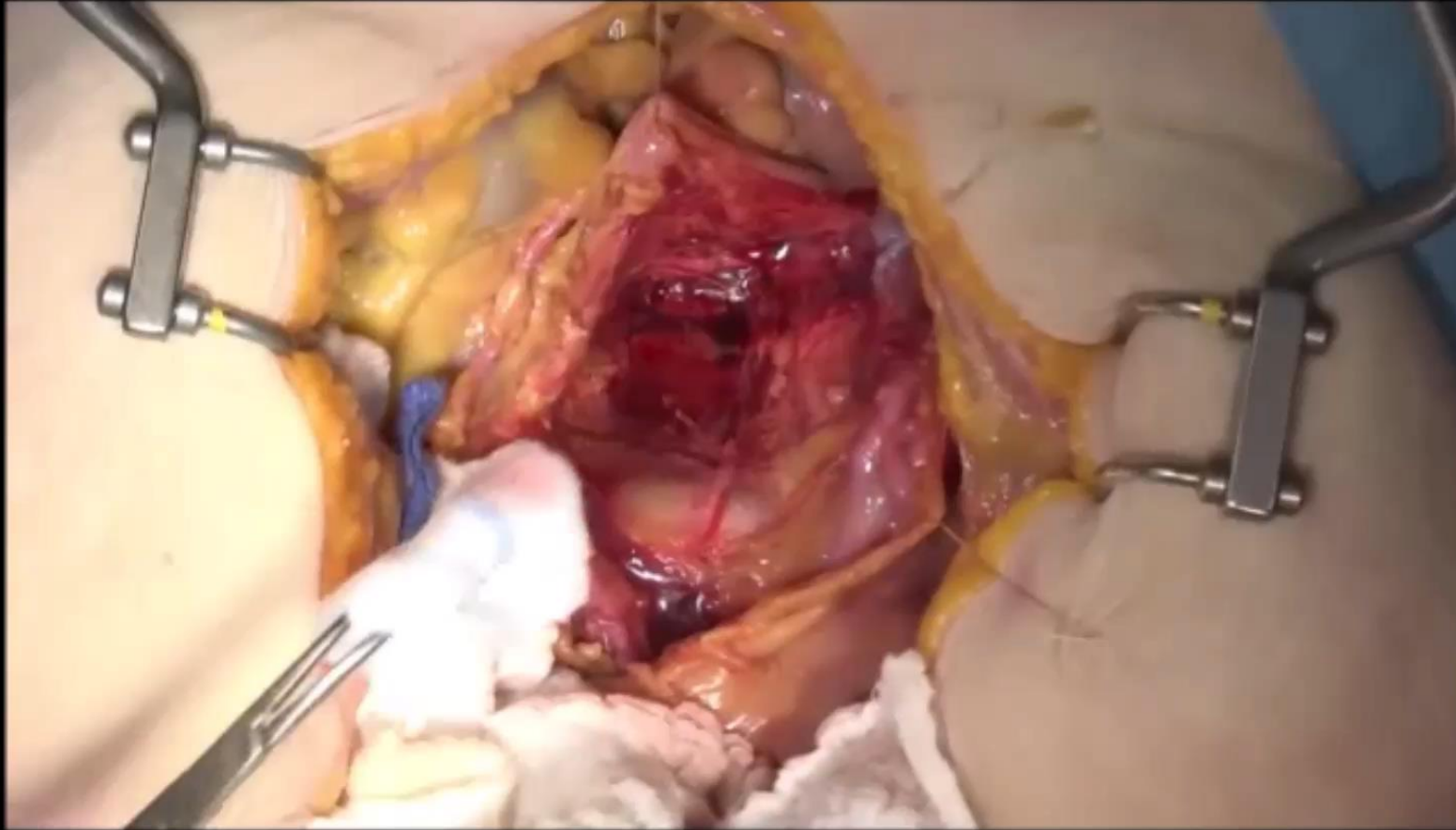
No need to convert to open surgery except if you can't apply the techniques laparoscopically



Pelvic packing	
	Traditional with compresses
	Pelvic Packing
	Compartmental hemostatic balloon
	Plugging with Bonewax [®]
	Plugging with bone cement



Compression and Packing



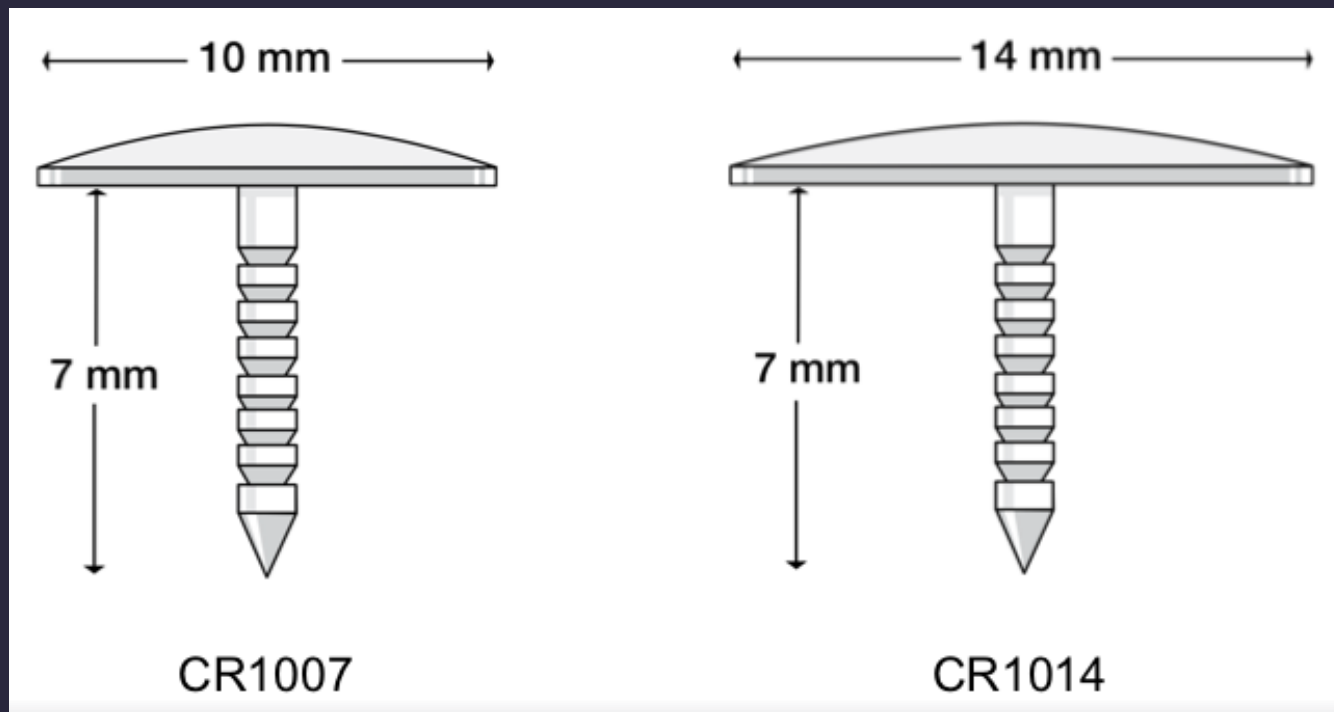
Hokenstad ED, Occhino JA. Int Urogynecol J. 2020 Jan



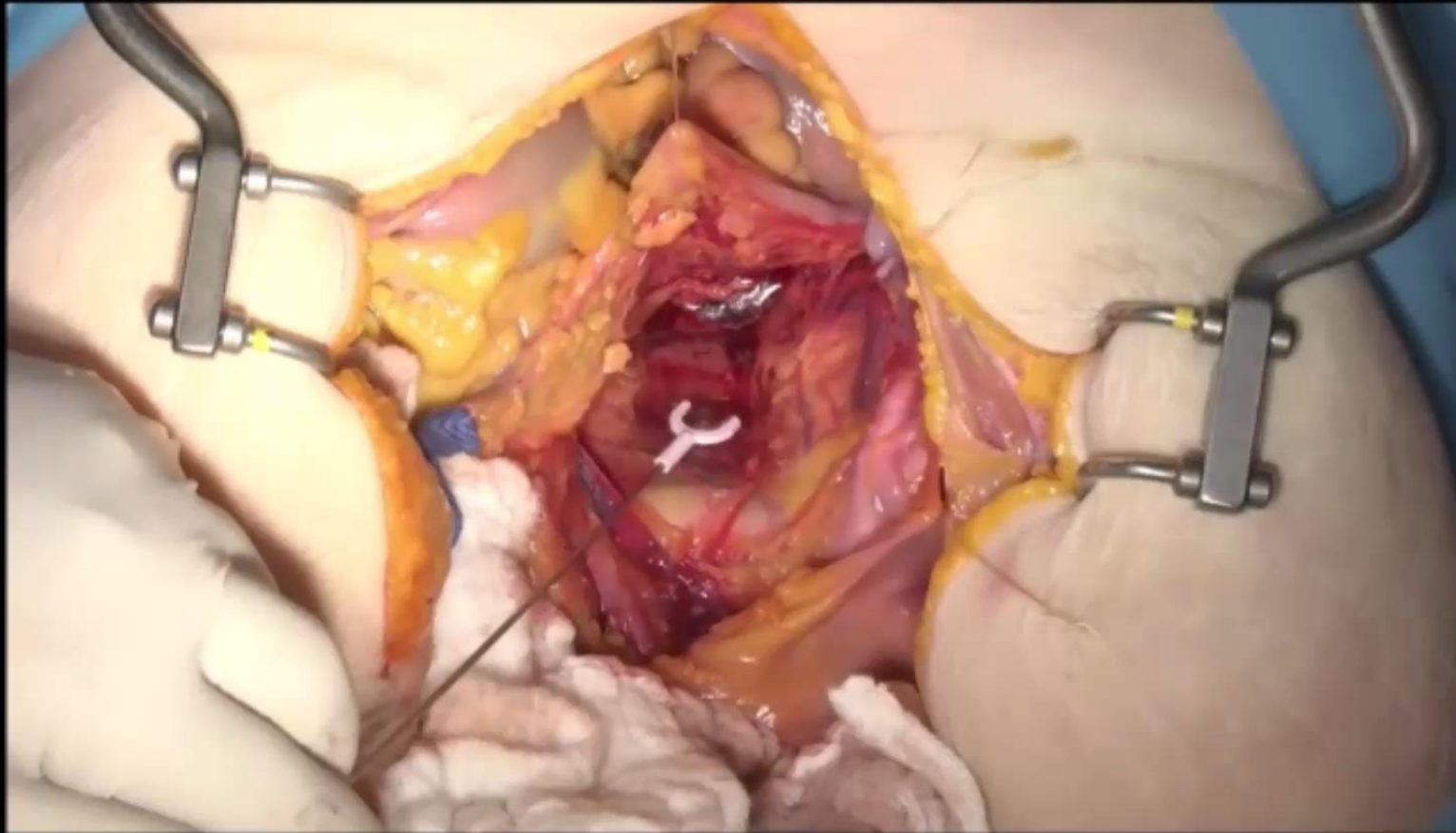
Metal implants	
	Thumb Tacks
	Helical titanium pins + Surgicel [®]
	Staples + cancellous bone + Surgicel [®]
	Ligaclips [®]
Topical hemostatic agents	
	Cyanoacrylate + Surgicel [®]
	Ankaferd Blood Stopper [®]
	Flo seal [®] + Surgicel [®]
	Cyanoacrylate



Thumb Tack



Thumb Tack



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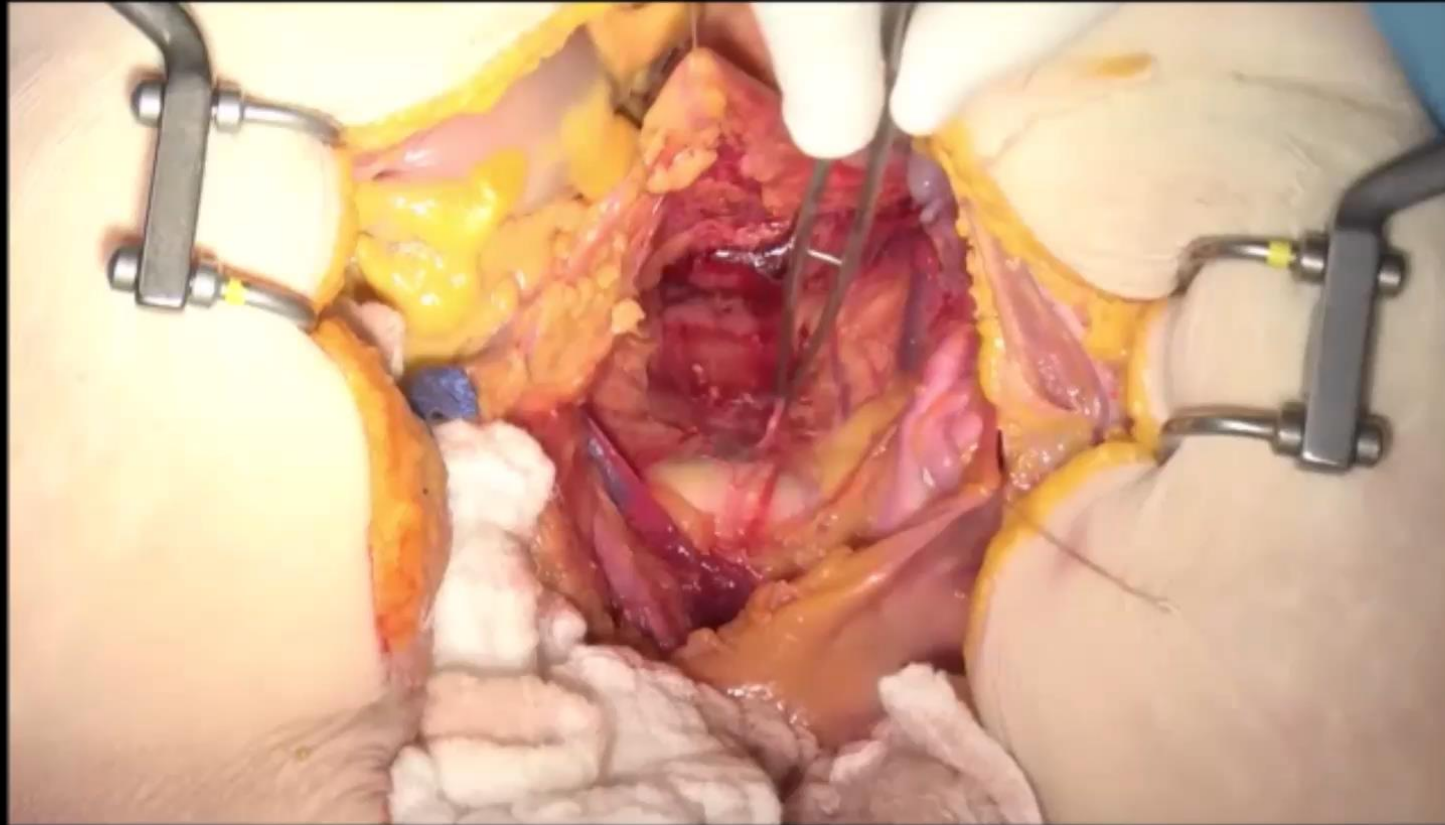


Contraindications

1. Severe instability of the patient
2. Bleeding further than 2 cm from the midline
3. Bleeding originates from a sacral neural foramina or a vital structure such as a ureter, rectum, or vagina
4. Diffuse hemorrhage related to a systemic coagulation disorder
5. not controllable by fingertip pressure against the anterior surface of the sacrum



Surgical Clips, Sutures



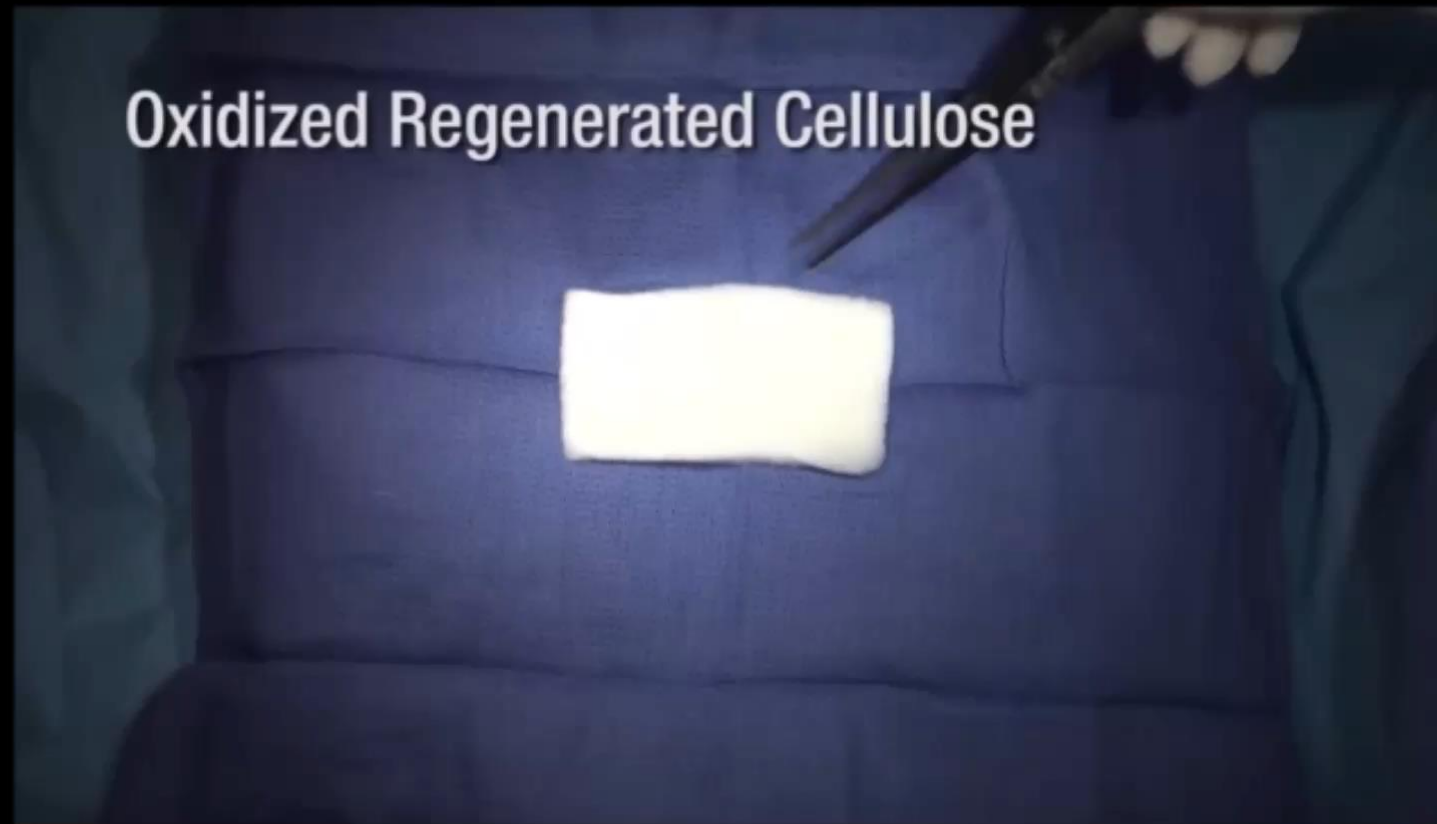
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Direct/indirect electrocoagulation	
	Spray electrocautery
	Bipolar coagulation
	Argon coagulation
	Electrocoagulation on a piece of epiploic appendix/muscle fragment



ROC & Electrocautery



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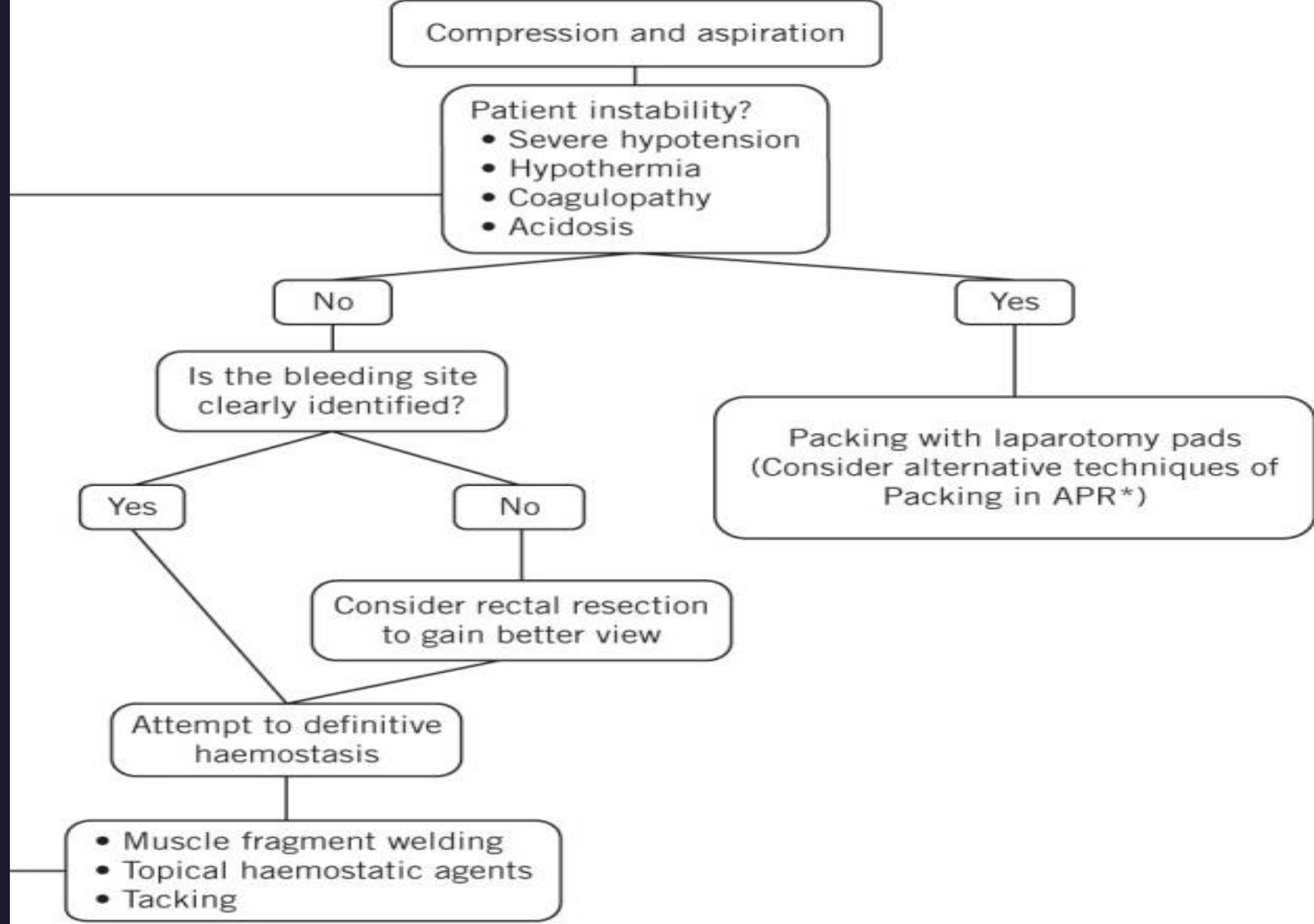


Muscle and fat fragments



Hokenstad ED, Occhino JA. Int Urogynecol J. 2020 Jan





Conclusions

- First hold pressure with a laparotomy sponge
- Anesthetists are made aware in the event and blood products need to be ordered
- During this time , call for any product you may need to achieve hemostasis, or begin harvesting rectus muscle for welding
- The sponge is slowly withdrawn and the bleeding can be evaluated to decide which technique to use, apply the gelatin matrix with thrombin, suture a bleeding vessel, perform muscle fragment welding, etc.
- Presacral bleeding encountered during pelvic surgery has the potential to be catastrophic and familiarity with a variety of techniques and locally available products will aid in the management





Thank you

