Prevention and management of anal sphincter injury: practical advice for the delivery room

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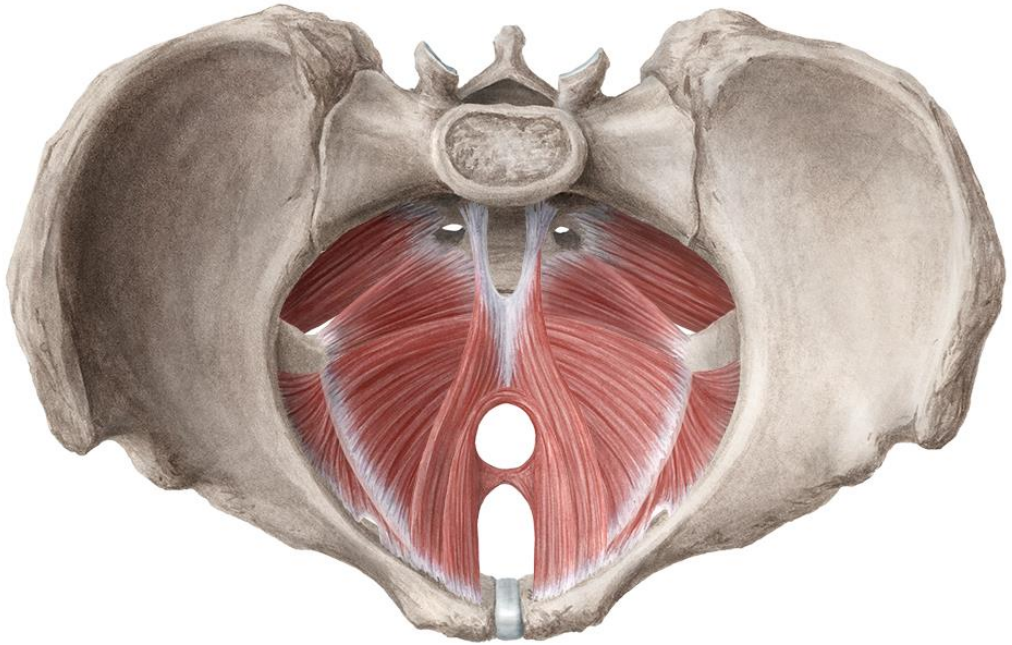
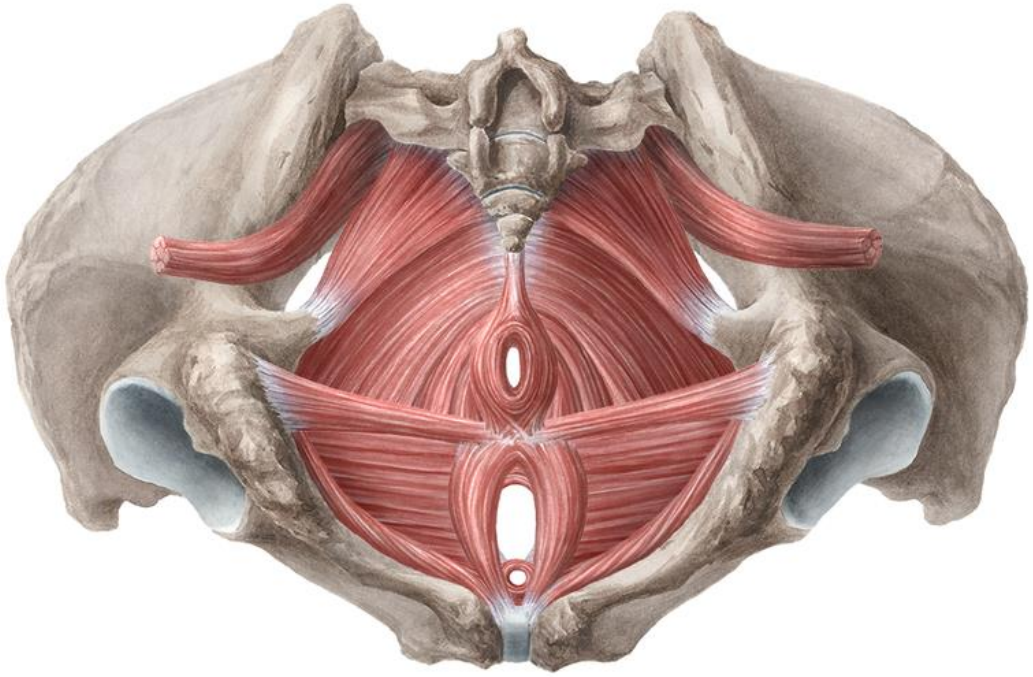
Muscles of the female pelvic floor

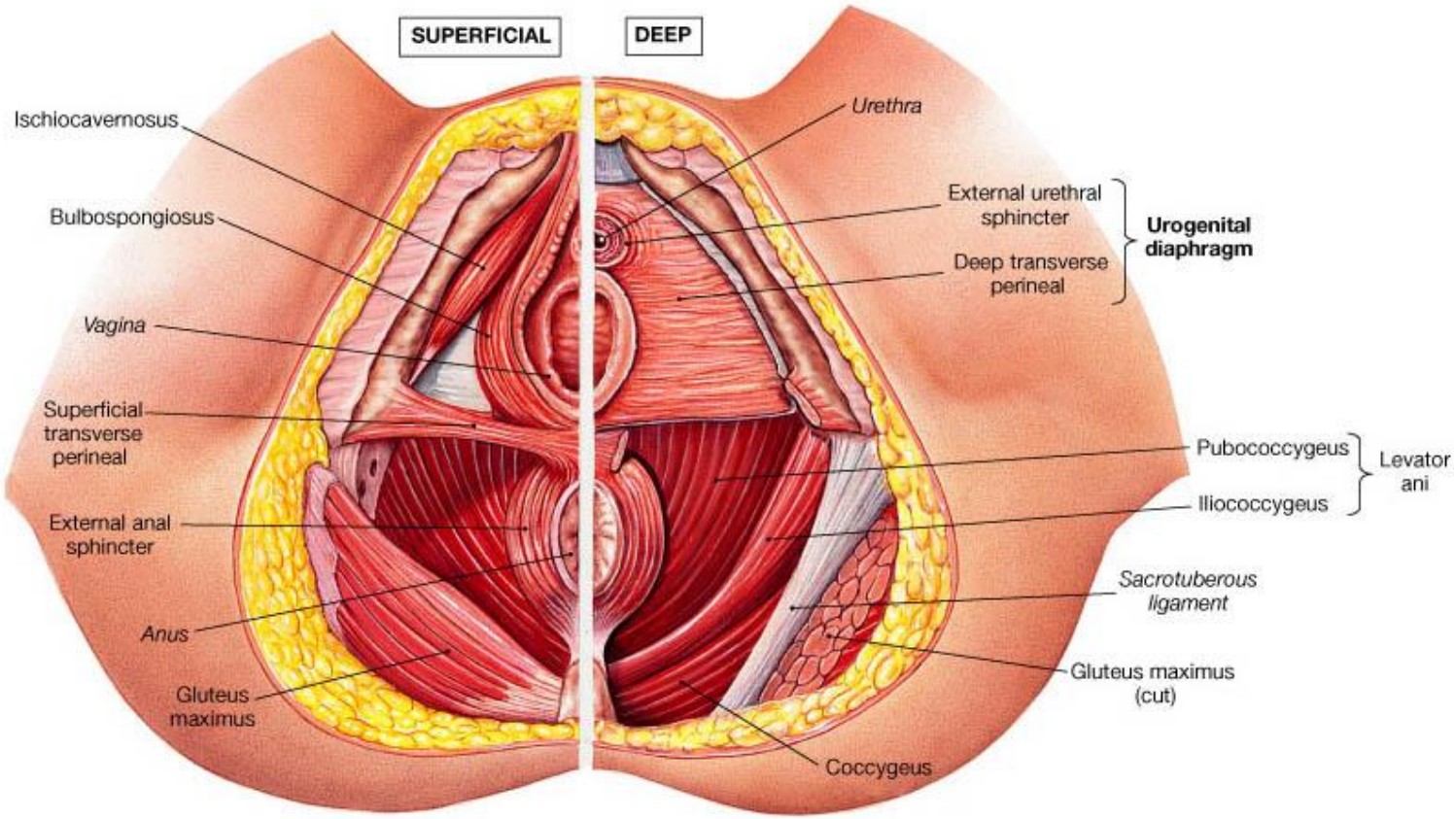


Superior view



Inferior view

Muscles of the female pelvic floor



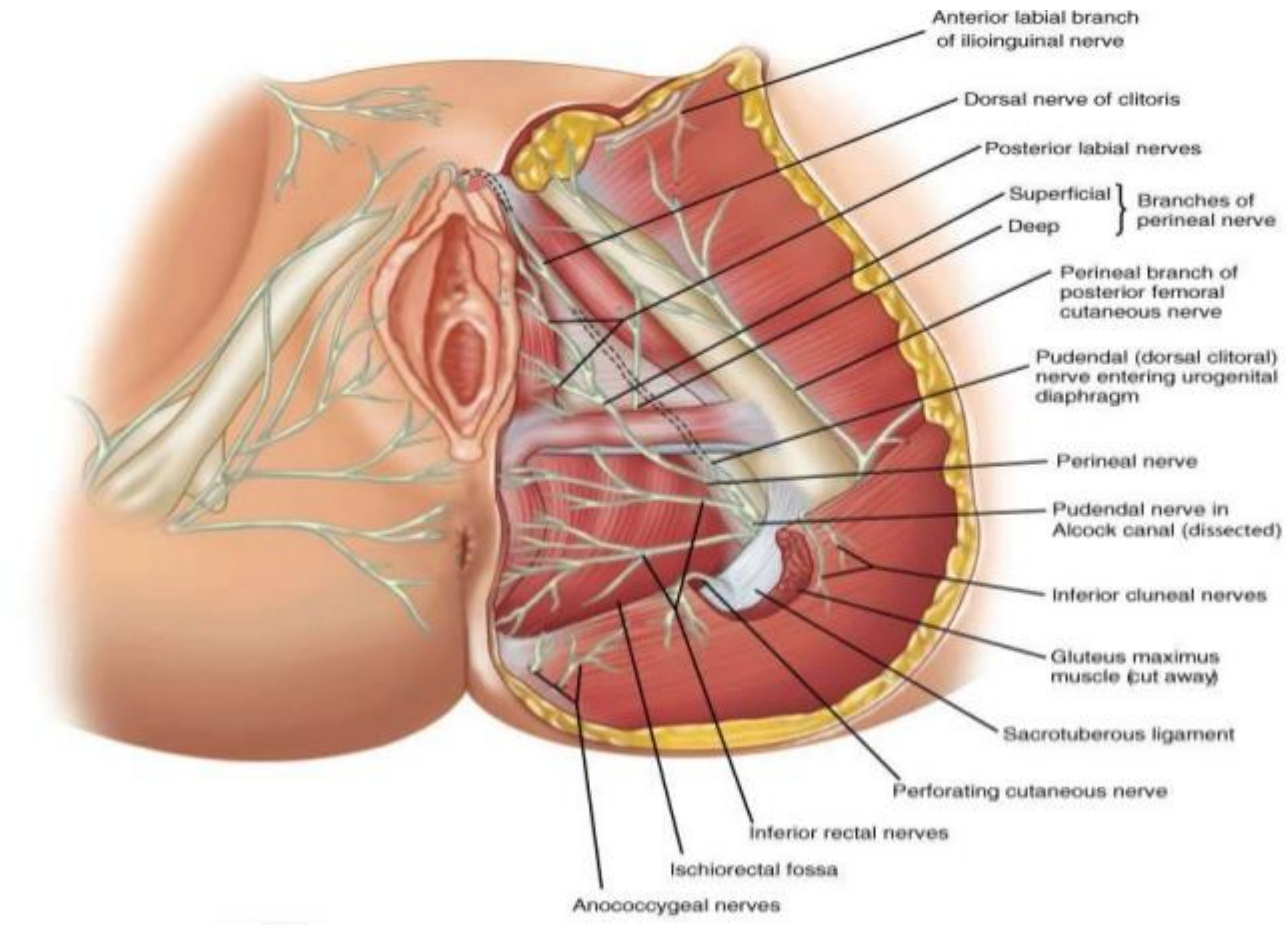
(a) Female

Muscles of the female pelvic floor

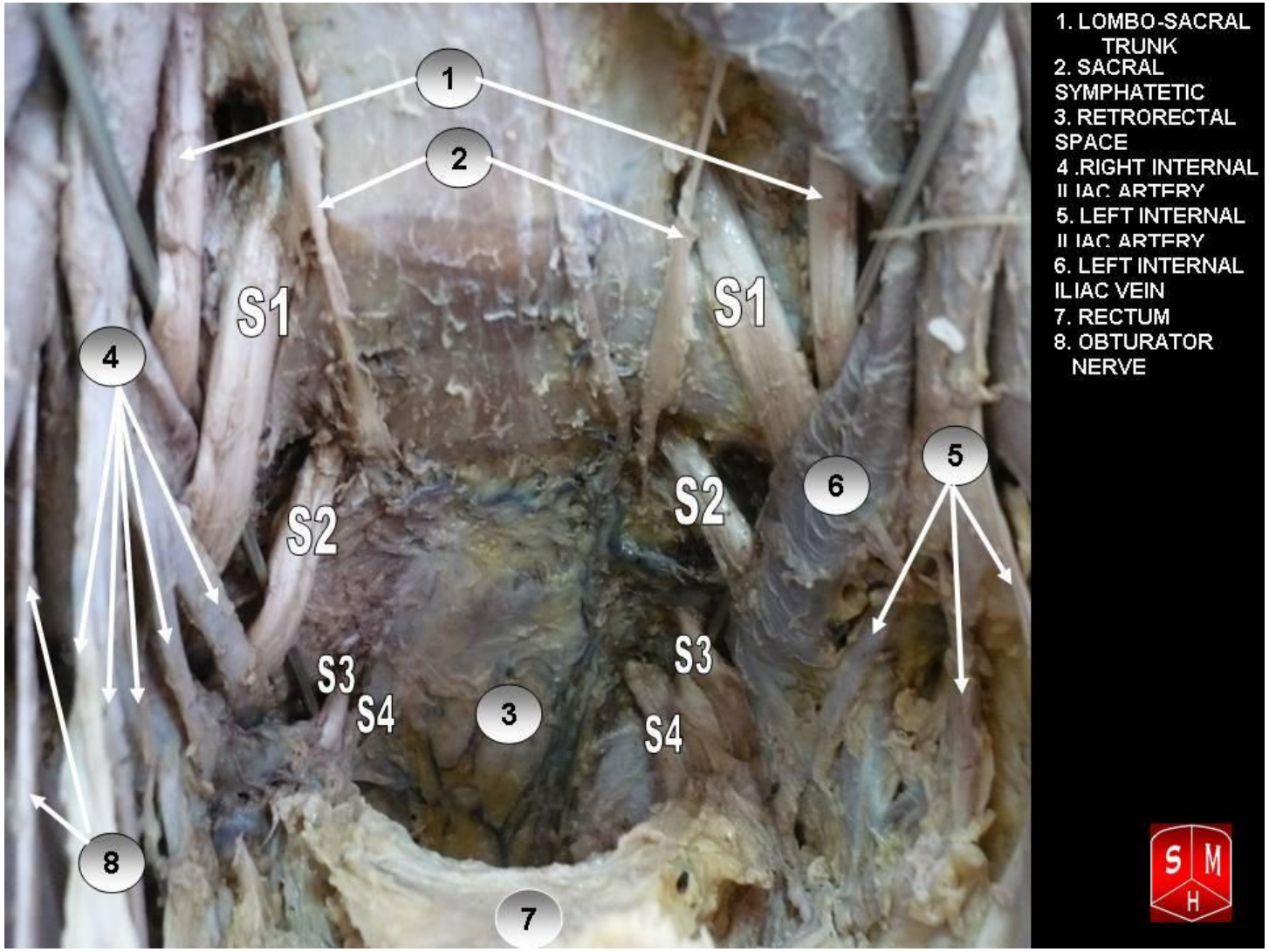
The muscles which form the pelvic floor are:

- Levator ani –
  1. pubococcygeus
  2. puborectalis
  3. Iliococcygeus
- Coccygeus
- Connective tissue

Neuroanatomy of the female pelvic floor



The sacral plexus



Neuroanatomy of the female pelvic floor

- The pelvic floor muscles are supplied by the pudendal nerve and its branches
- Has both motor and sensory functions
- Emerges from the ventral rami of S2, S3 and mainly S4
- Passes through Alcock's (pudendal) canal together with the internal pudendal vessels
- Gives rise to the following branches:
  1. Inferior rectal nerve
  2. Perineal nerve
  3. Dorsal nerve of the clitoris

Neuroanatomy of the female pelvic floor

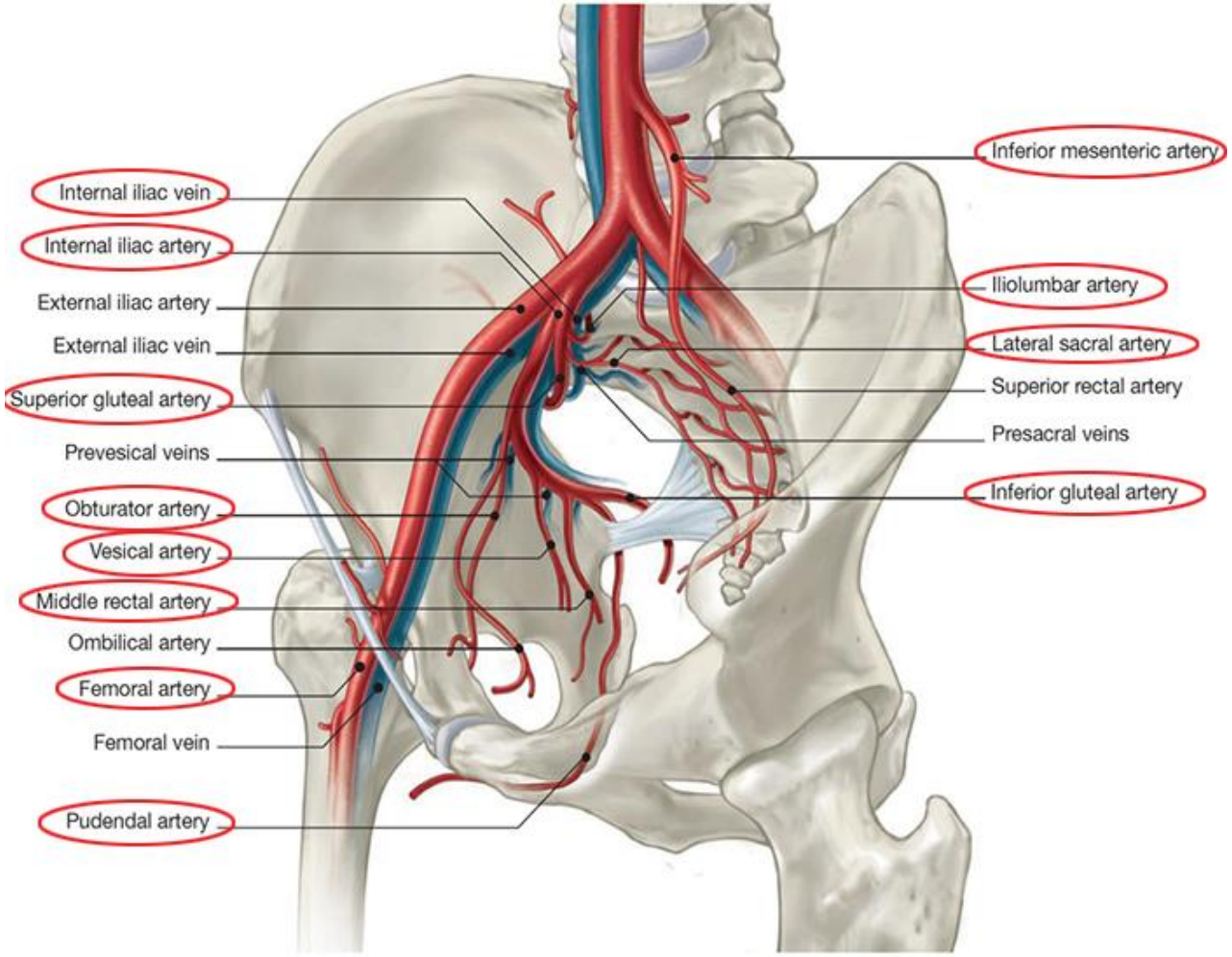
The pudendal nerve may be damaged (neuropathy) by:

1. Labour
2. Systemic diseases (such as diabetes)
3. Pelvic tumours

Pudendal neuropathy may lead to:

1. Faecal incontinence
2. Stress urinary incontinence
3. Paraesthesia
4. Sexual dysfunction

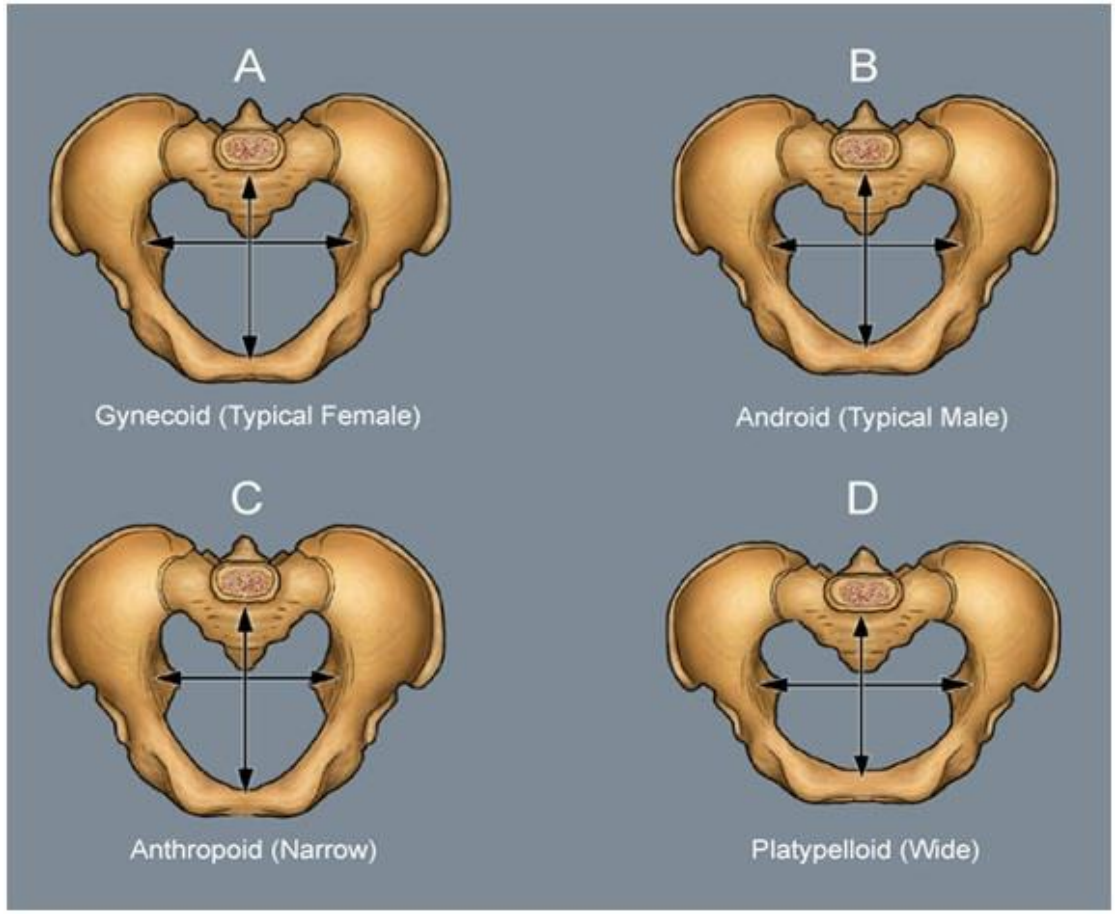
Vasculature of the female pelvic floor



Vasculature of the female pelvic floor

- The pudendal vessels supply the muscles of the pelvic floor and the external genitalia
- The internal pudendal artery is a branch of the anterior division of the internal iliac artery
- Gives rise to the following branches:
  1. Inferior rectal
  2. Perineal
  3. Posterior labial branches
  4. Deep and dorsal artery of clitoris
  5. Artery of bulb of vestibule

The Caldwell-Moloy classification



Mechanism of labour

The cardinal movements in labour are:

- Engagement
- Descent
- Flexion
- Internal rotation
- Extension
- Restitution and external rotation
- Expulsion

Obstetric anal sphincter injury

Types:

1. 1st degree – laceration of vaginal mucosa
2. 2nd degree – involvement of perineal muscles, sparing the anal sphincter
3. **3rd degree – disruption of the anal sphincter**
    1. 3a - <50% of external sphincter involved
    2. 3b - >50% of external sphincter involved
    3. 3c – external and internal sphincter involved
4. **4th degree – 3rd degree + breach of anal mucosa**
5. Rectal button-hole tear

Reported in:

- Up to 35% in primiparous women
- 2.5% of vaginal deliveries with mediolateral episiotomy
- 11% of vaginal deliveries with midline episiotomy

Third and fourth degree sphincter injuries

Obstetric anal sphincter injury

Risk factors:

- Primiparity
- Asian ethnicity
- Induction of labour
- Birth weight >4Kg
- Persistent OP position
- Second stage >1hour
- Epidural analgesia
- Midline episiotomy
- Instrumental delivery (forceps)
- Shoulder dystocia
- Face and brow presentation
- Previous 3rd degree tear

Management of anal sphincter injury

Principles underlying anal sphincter repair:

- Adequate explanation of findings and procedure
- To be performed by an experienced doctor or trainee under supervision
- Conducted in an operating theatre under good lighting and aseptic conditions
- Adequate analgesia (general or regional)
- Careful evaluation and grading of injury
- All layers should be repaired separately
- Avoid figure-of-eight suturing – risk of tissue ischaemia

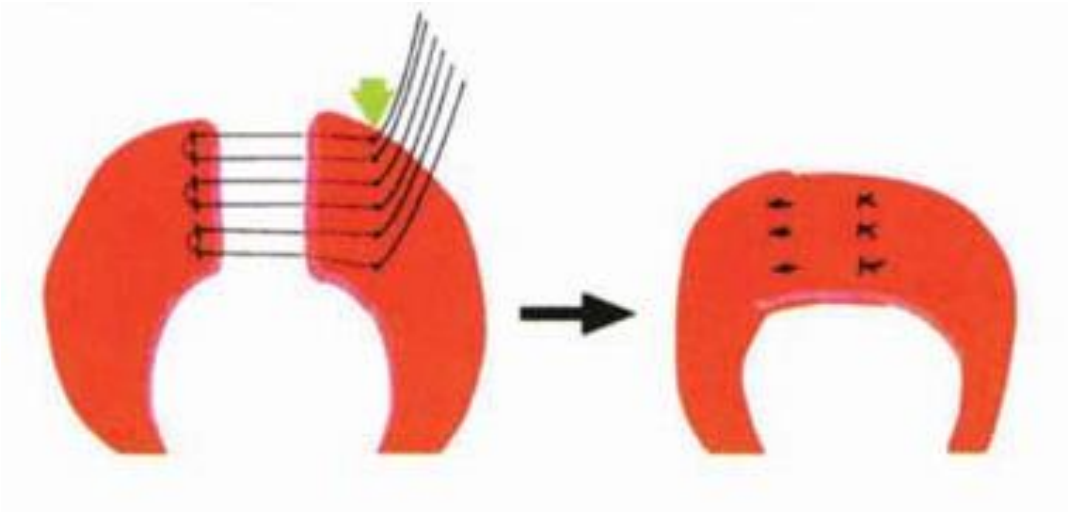
Management of anal sphincter injury

Principles underlying anal sphincter repair:

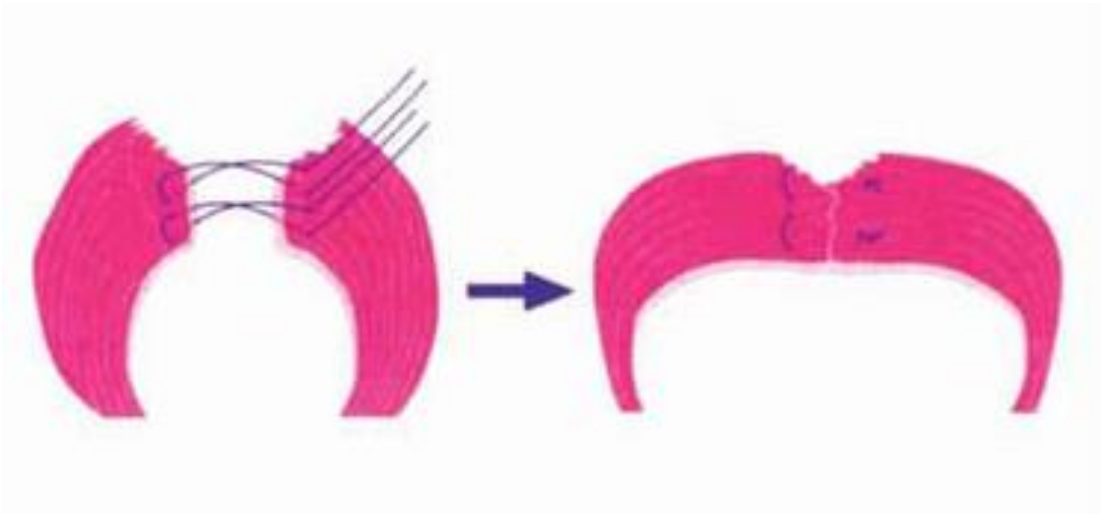
- Partial-thickness tears – use end-to-end anastomosis
- Full-thickness tears – either end-to-end OR overlap anatamosis
- Antibiotic cover – cefuroxime and metronidazole
- Bladder catheterisation
- Digital rectal exam post procedure - ?suture in anorectal mucosa
- Proper documentation
- Use of stool softeners and adequate analgesia post procedure

Management of anal sphincter injury

Techniques:



Overlap technique



End-to-end anastamosis

Management of anal sphincter injury

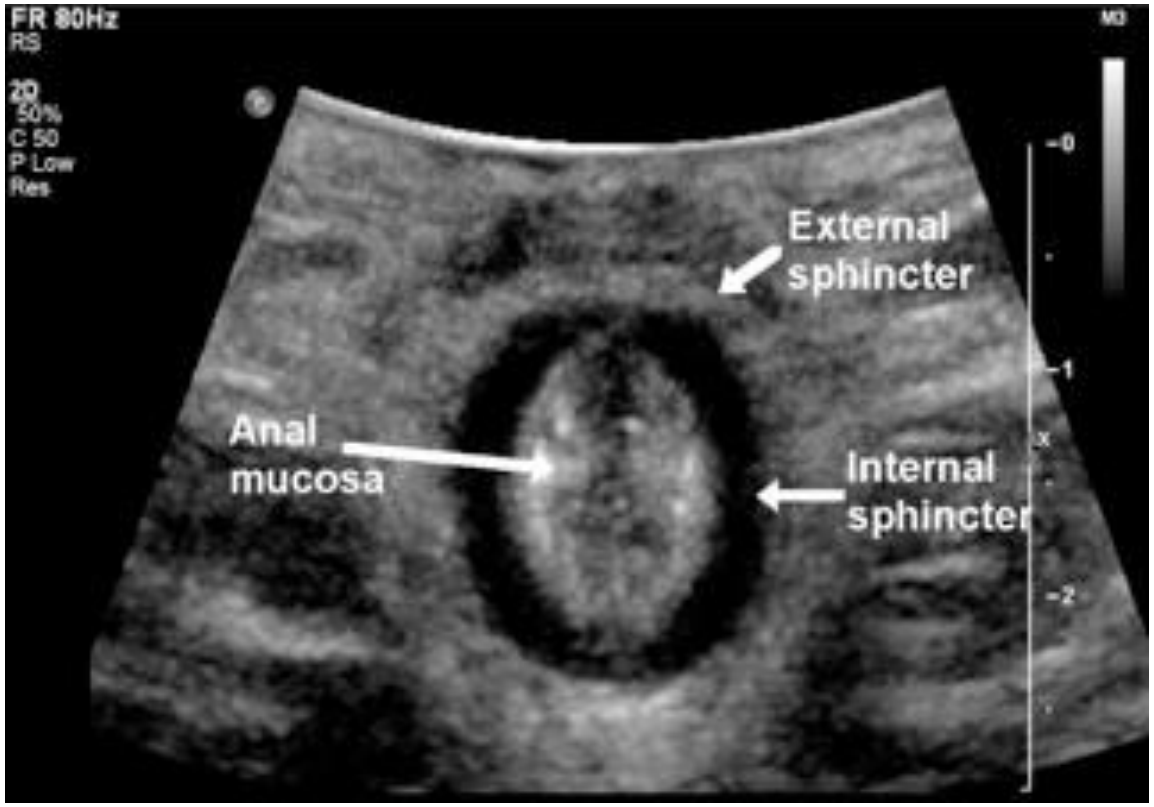
Suturing material to be used:

- Polyglactin (Vicryl) 2-0; or
- Polydiaxanone (PDS) 3-0 may also be used
- Prolene sutures may cause abscess-formation, discomfort, suture migration and sinuses

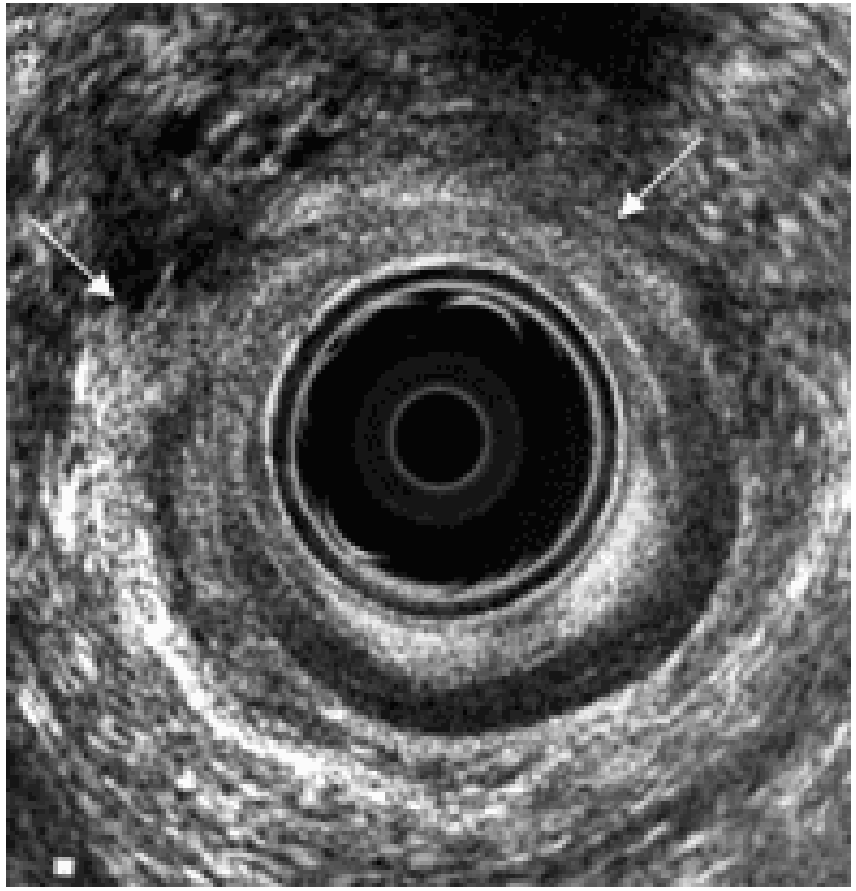
Follow-up

- Appropriate follow-up 6 to 12 weeks post partum
- Enquire about bowel, bladder and sexual function
- Examination of patient for healing of wound and anal tone
- The use of diagnostic tests such as anal endosonography, electromyelography (EMG) and manometry
- Appropriate referral if required – physiotherapists, colorectal surgeon

Anal endosonography



Anal endosonography



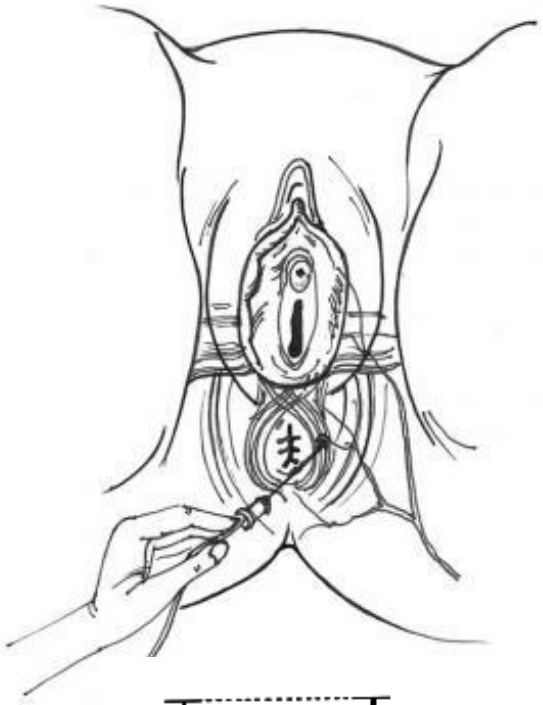
Anterior tear

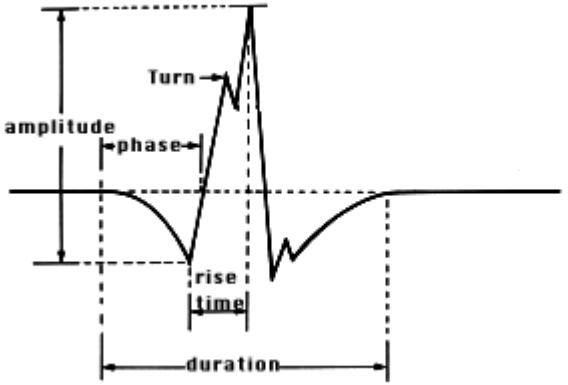
Electromyelography of the anal sphincter

- External anal sphincter EMG may be useful in patients presenting with bladder, bowel and sexual dysfuntion (neuropathy of lower sacral segments)

- Needle EMG is superior to surface EMG

- Contraindications to EMG: anticoagulation, infection, oedema, surgical site





Manometry

Manometry assesses

- the volume of rectal distension required to produce the first sensation of distension and a sustained feeling of urgency to defecate;
- rectal compliance
- amplitude and duration of voluntary contractions of the external anal sphincter
- resting pressure in the anal canal

Medico-legal aspects

- Rectal exam prior to and after any perineal repair
- Careful documentation
- Appropriate classification of tear
- Appropriate management of tear
- Repair of tear by trained doctors
- Deviation from safe practices
- Failure to inform and counsel the patient
- Inappropriate follow-up
- Inappropriate advice on subsequent pregnancies

Practical advice

- Explain to women that the evidence for the protective effect of episiotomy is conflicting
- Perform a mediolateral episiotomy only if clinically indicated (e.g. foetal distress)
- Consider mediolateral episiotomy in instrumental deliveries
- Where episiotomy is indicated ensure that the angle is 60 degrees away from the midline when the perineum is distended
- Perineal protection at crowning
- Warm compression during the second stage of labour
- Pelvic-floor exercises (Kegel's)

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Thank you