Diagnosis and repair of acute 3rd and 4th degree anal sphincter tears

W33, 30 August 2011 09:00 - 13:00

Start	End	Topic	Speakers
09:00	09:10	Introduction	• Abdul Sultan
09:10	09:30	Anatomy and Physiology of the anal sphincter	• Ranee Thakar
09:30	09:40	Anal endosonography	• Ranee Thakar
09:40	10:10	Diagnosis of anal sphincter injury	• Abdul Sultan
10:10	10:30	Repair of 3rd and 4th degree tears	• Abdul Sultan
10:30	11:00	Break	None
11:00	11:15	Management of subsequent pregnancy	• Abdul Sultan
11:15	11:25	Video repair on model	• Ranee Thakar
11:25	11:35	Video diagnosis of anal sphincter injury	• Ranee Thakar
11:35	11:45	Video of repair in woman	• Abdul Sultan
11:45	12:00	Video repair in pig	• Ranee Thakar
12:00	13:00	Hands-on pig sphincter dissection and repair	All

Aims of course/workshop

Aim:

To learn how to identify, repair and manage primary obstetric anal sphincter injuries.

Objectives:

- Understand the anatomy and physiology of the anal sphincter.
- Learn the technique and interpretation of endoanal ultrasound
- Recognise and classify anal sphincter injury
- Observe a live video and as well as a purpose built model
- Have hands on experience of repairing pig anal sphincters
- Understand the dilemmas regarding prevention and management of subsequent pregnancies
- Labour Ward protocol
- Have insight into the complications of anal sphincter trauma
- Set up a perineal clinic
- Skills to run a perineal trauma course

Educational Objectives

Diagnosis and repair of obstetric perineal trauma is a very poorly taught subject throughout the world. We are aware of this from questionnaires that have been completed in 52 hands-on workshops in the UK and 26 cities outside the UK. We have evaluation forms from previous ICS and IUGA workshops to confirm its popularity and necessity. The consequences of missing a third or fourth degree tear is faecal incontinence.....a devastating condition that can have long term effects on a woman's social and physical wellbeing. We teach simple clinical tips on how we do it and how the attendees can teach others to minimise the consequences of perineal and anal sphincter injuries.

Applied anatomy of the perineum and anorectum

Ranee Thakar

Anatomy of the anorectum (Fig 1)

The anorectum is the most distal part of the gastrointestinal tract and consists of two parts: the anal canal and rectum. The anal canal measures about 3.5 cms and lies below the anorectal junction formed by the puborectalis muscle. The striated external anal sphincter (EAS) is made up of three parts (subcutaneous, superficial and deep) and is inseparable from the puborectalis dorsally. The internal anal sphincter (IAS) is a thickened continuation of the circular smooth muscle of the rectum. It is separated from the EAS by the conjoint longitudinal coat which is a continuation of the longitudinal smooth muscle of the rectum.

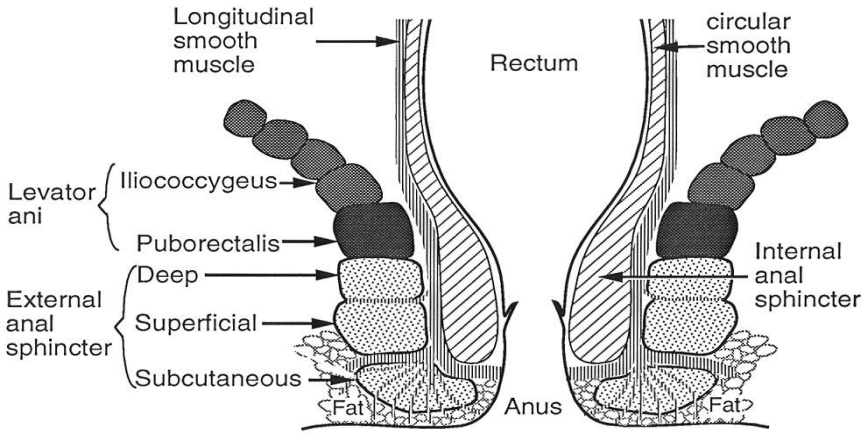
EAS:

- Striated muscle in a state of tonic contraction
- Innervated by the Pudendal nerve
- Up to 30% of resting pressure.
- Most of the squeeze pressure.
- Contraction maintained for < 2 minutes
- Reflex contraction with sudden increase in intra-abdominal pressure
- Relaxes during straining
- Damage results in urge faecal incontinence

IAS:

- Smooth muscle
- Autonomic control
- Contributes up to 70% of resting pressure
- Damage results in passive soiling and flatus incontinence

Figure 1: Anatomy of the anal sphincter

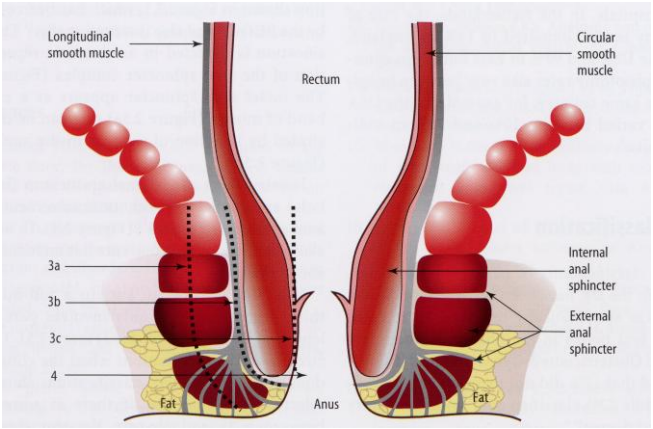


Diagnosis of obstetric anal sphincter injuries (OASIS)

Abdul H Sultan

- Until the advent of anal ultrasound, the development of anal incontinence was attributed largely to pelvic neuropathy.
- However prospective studies before and after childbirth have shown that up to one third of women sustain anal sphincter damage that is not recognised at delivery (Sultan AH et al 1993).
- Andrews et al (2006) performed a study in which 241 women having their first vaginal delivery had their perineum re-examined by an experienced research fellow and endoanal ultrasound was performed immediately after delivery and repeated 7 weeks postpartum. When OASIS were identified by the research fellow, the injuries were confirmed and repaired by the duty registrar or consultant. The prevalence of clinically diagnosed OASIS increased from 11% to 25% (n=59). Every clinically diagnosed injury was identified by postpartum endoanal ultrasound. At 7 weeks no *de novo* defects were identified by ultrasound. This study concluded that most if not all sphincter defects that have previously been designated as "occult" injuries were in fact injuries that should have been recognisable at delivery. It was alarming to find that 87% and 27% of OASIS were not identified by midwives and doctors respectively. Although it is likely that some of these would have been detected at the time of suturing the tear, it is of concern that clinical recognition of OASIS is suboptimal.
- This finding is not unique as Groom and Patterson found that the rate of third degree tears rose to 15% when all "2nd degree tears" were re-examined by a second experienced person.
- It has been shown that only 16% of doctors and 39% of midwives feel that they were trained adequately to identify OASIS (Sultan et al 1995).
- On the other hand it is possible that the sphincter tear had been recognised but classified as a second-degree tear. A questionnaire sent to all UK consultants (Fernando et al 2002) and trainees (Sultan et al 1995) confirmed that up to 40% are still classifying partial and even complete disruption of the sphincter as a second degree. The reason for this confusion is partly due to previous teachings (Sultan & Thakar 2002) and therefore for the sake of clarification and consistency Sultan (1999) proposed a comprehensive classification that is now accepted by RCOG (Greentop guideline 2007), NICE (Nice.org.uk) and the International Consultation on Incontinence (Norton et al 2002) (Fig 2):

Fig 2: Classification of OASIS (Sultan 2007 Springer)



OASIS – Classification (See Fig 2)

Sultan AH, Clinical Risk 1999; RCOG GreenTop Guidelines 2001; ICI 2002; NICE 2007

1st degree = vaginal epithelium
2nd degree = perineal muscles
3rd degree = anal sphincter
- 3a = <50% external sphincter thickness
- 3b = > 50% external sphincter thickness
- 3c = internal sphincter torn

4th degree = 3rd degree + anal epithelium torn

Repair techniques of obstetric anal sphincter injuries (OASIS)

Abdul Sultan

Anal incontinence after primary repair of OASIS *Sultan AH,Thakar R 2007*

35 studies in the last 25 years

- Anal incontinence mean 39% (range 15 to 61%)
- Faecal incontinence mean 14% (range 2-29%)

Internal sphincter defects *Mahony R et al 2007*

- 500 consecutive OASIS
- Persistent IAS defect independently associated with severe anal incontinence. OR 5.1 (95% CI = 1.5 – 22.9)

Fecal incontinence after vaginal delivery *Fenner DE et al AJOG 2003*

- 831 primips completed bowel questionnaire 6 months after delivery
- 20% sustained OASIS
- 30% OASIS vs 20% of controls had poor bowel control.
- Symptoms 10x higher in 4th degree tears

Immediate –vs- delayed repair *Nordenstam J et al 2008*

- RCT of 161 women
- Team of 3 obstetricians and 3 colorectal surgeons
- At 12 months 40% reported any anal incontinence (17% flatus > 1 per week)
- No difference in outcome between immediate and delayed (8 to 12 hours) repair

No justification in delaying repair until the next day.

Delayed and early secondary anal sphincter repair

Soerensen MM et al 2008

- 21 female patients and 21 controls
- Delayed primary repair (<72 hours postpartum)
- Early secondary repair (<14 days postpartum)
- Repaired by 2 senior obstetricians
- Mean follow up of 4 years
- No post-op complications and none needed colostomy
- No significant difference in QoL with 19 controls

25% vs 5% of controls had faecal incontinence

Primary repair by colorectal surgeons *Kairaluoma MV et al 2004*

- n = 30; 24 months follow-up
- 3 patients - repair was delayed (13 to 24 hours)
- 23% anal incontinence;
- 3% rectovaginal fistula; 23% wound dehiscence
- 27% dyspareunia; 7% defaecatory pain

Primary repair by urogynaecologist *Abramov Y et al 2008*

- OASIS (n=22)
- Anal incontinence in 9.5% (flatus)
- No faecal incontinence; 0 rectovaginal fistula; 0 wound dehiscence
- 5% dyspareunia; 0 defaecatory pain

Anal canal length & good outcome *Hool GR et al DCR 1998*

- Secondary overlap sphincter repair (n=51)
- Mean follow-up = 16 months
- Post-operative anal canal length best predicted continence

Secondary anal sphincter repair *Engel AF et al 1994; Malouf AJ et al 2000*

- Prospective study (n= 55) of overlap repair.
- 80% success at 18 months
- 50% at 5 years (n=46)
- But one third had more than one repair

overlap vs end-to-end repair *Sultan AH et al 1999*

- Anal incontinence: reduced from 42% to 8% (flatus)
- External sphincter defects: reduced from 85% to 15%
- Technique or operator? randomised study needed

End-to-end vs overlap RCT *Fernando R et al 2004*

- 64 randomised
- At one year compared to the end-to-end repair, significantly fewer women with overlap EAS repair suffered faecal incontinence
- 9 of 15 who had 3c/4th degree tear had FU scans
- All 9 had intact IAS.

Suture materials (*www.perineum.net)*

- Anal Mucosa - Vicryl 3-0
- Internal Anal Sphincter - Mattress end-to-end PDS 3-0
- External Anal Sphincter - Mattress/Overlap PDS 3-0

Suture material *Williams et al 2006*

- 112 women – 4x4 randomised study
- No difference in suture related morbidity between Vicryl and PDS
- But 70% were 3a tears and only 54% 12 month follow-up

Operating Theatre

- Sterile environment
- Good lighting
- Good exposure
- Appropriate instrument tray, sutures
- Anaesthesia – spinal, epidural, General
- Assistance

Antibiotic prophylaxis for OASIS *Duggal N et al 2008*

- Prospective placebo controlled RCT (n=147)
- Single IV dose of cephalosporin
- Perineal wound infection 8% vs 24% in placebo

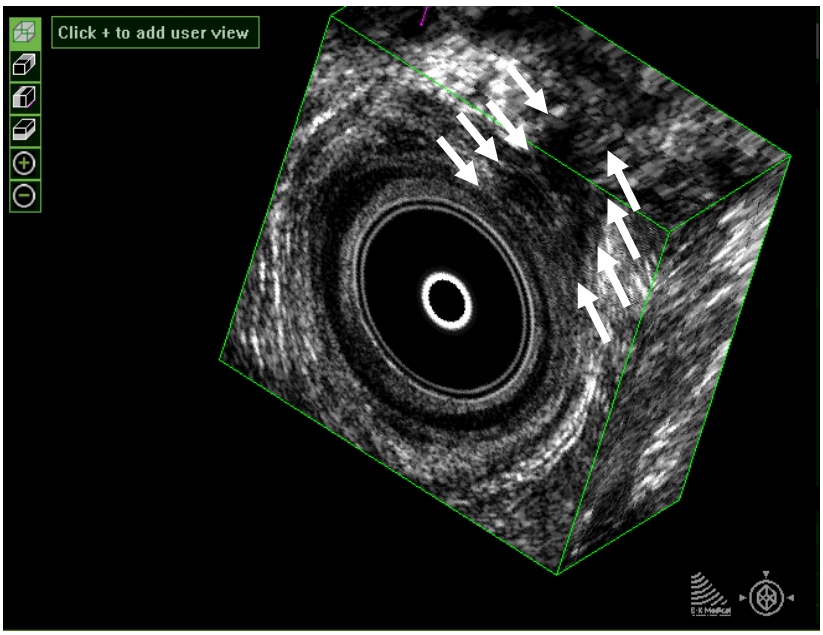
Oasis repair - recommended practice *Sultan AH, Thakar R 2007*

- Experienced obstetrician
- Operating theatre
- Regional or general anaesthesia
- IV Antibiotics
- EAS
  - → End-to-end for 3a
  - → End-to-end or overlap for full thickness 3b
- IAS → End–to-end mattress
- Monofilament sutures (PDS) for the sphincter
- Rectal examination before and after repair
- Foleys catheter for 12 hours
- Lactulose 15mls bd for 7 to 10 days
- Clinic Follow up in 2 to 3 months

Labour Ward Protocol

See website *www.perineum.net*

Fig 3 External anal sphincter defect (between arrows) on 3d endoanal ultrasound



Dilemmas and management of OASIS after subsequent pregnancy

Abdul Sultan, Ranee Thakar

Mode of delivery after OASIS
Caesarean section or Vaginal delivery?

Recurrence risks with previous OASIS *Peleg D et al 1999*

- Primips, ceph, term, $3^o/4^o$ (n=704); Incidence = 19% (midline episiotomy)
- Recurrence rate = 12% vs 7 % if no previous OASIS (P=0.001)

Previous OASIS - *is recurrence predictable?* *Harkin R et al 2003*

- Mediolateral episiotomy
- 2 of 45 (4.4%) in subsequent vaginal deliveries developed a repeat OASIS

Previous OASIS *Poen AC et al 1998*

- 43 of 110 women studied
- Anal incontinence 56% -v- 34% in women with no subsequent delivery. (RR = 1.6, CI = 1.1-2.5)

Previous OASIS *Sangalli MR et al 2000*

- 177 women 13 years FU
- Faecal Incontinence in 114 subsequent deliveries (3^o tears = 2.5% ; 4^o tears = 26.5%

Can OASIS be prevented ? Can only minimise the risk of OASIS

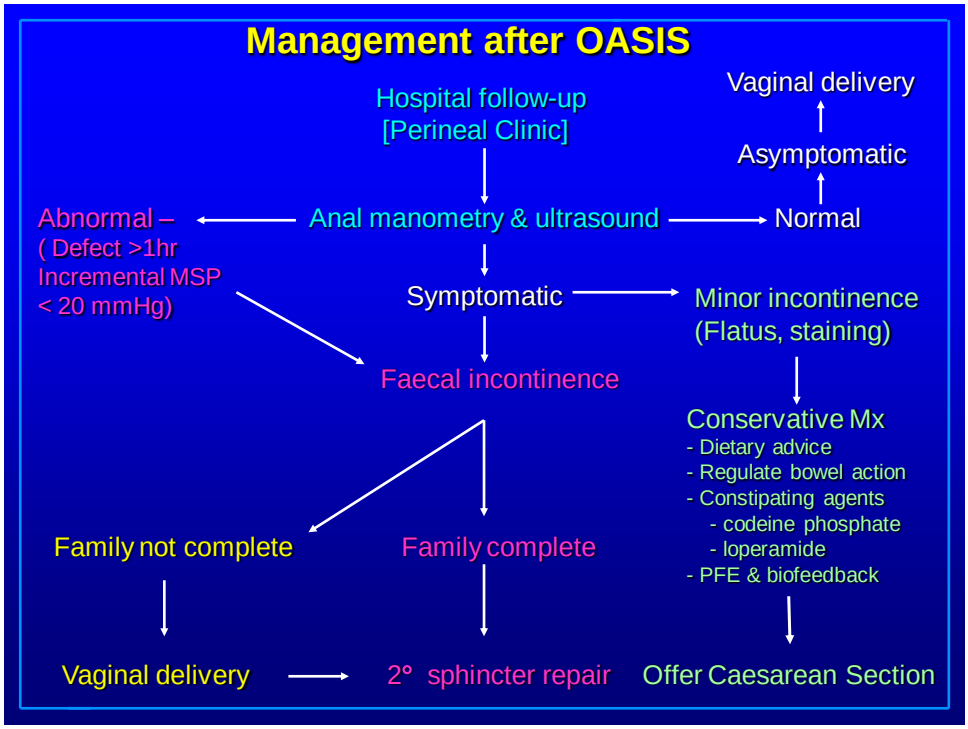
- Episiotomy
  - Restrictive vs Liberal
  - Mediolateral vs Midline
- Instrumental delivery
  - Vacuum vs Forceps

Performing mediolateral episiotomy *Andrews et al 2004; Andrews et al 2006*

- 254 primips, 41% mediolateral episiotomy
- No midwife and only 13 (22%) doctors performed a truly mediolateral episiotomy (between 40 to 60 degrees from the midline)
- Episiotomies angled closer to the midline significantly associated with OASIS (26 vs 37 degrees)

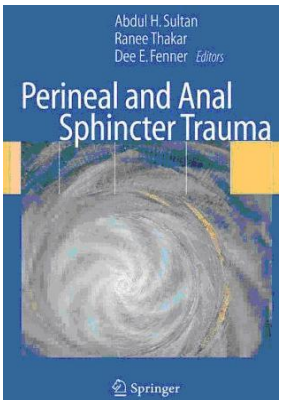
Episiotomy *Eogan et al 2006*

- 50% risk reduction of third degree tears for every 6° away from midline



For pictures, DVD, bibliography and suggested reading

See Website: www.perineum.net



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Take Home Message

- Every woman who has a vaginal delivery has a 3rd or 4th degree tear until proved otherwise
- A 3rd or 4th degree tear (as well as an isolated buttonhole tear of the rectum) cannot be excluded without a rectal examination
- Therefore a careful digital rectal examination with good exposure, adequate lighting and analgesia is mandatory.
- The best chance of successful repair of OASIS is at the time of delivery as secondary sphincter repair (especially of the internal sphincter) is comparatively poor
- Restoration of normal sphincter length best predicts continence
- In terms of subsequent pregnancy management:
  - Compare like with like ie. the worst scenario of CS and VD
  - Risks following CS is not just for one CS but cumulative with each subsequent CS
  - Outcome of vaginal delivery after OASIS is good in selected patients