

# Risk factors for and management of obstetric anal sphincter injury

Gillian Fowler

## Abstract

Obstetric anal sphincter injury is the leading cause of faecal incontinence in women. Concerns have been expressed that some sphincter injuries are missed at the time of vaginal childbirth. There has also been a steady increase in the number of medico-legal cases associated with obstetric sphincter injury.

Accurate diagnosis of third and fourth degree tears at the time of childbirth followed by primary repair by experienced personnel, in the correct setting, and using the correct technique has been shown to improve outcome and reduce faecal incontinence rates.

This article provides a comprehensive review of the risk factors for obstetric anal sphincter injury, together with the diagnosis, management and follow up of these women, based on the best available evidence.

**Keywords** anal sphincter injury; faecal incontinence

## Introduction

Approximately 70% of women will experience some degree of perineal injury following vaginal delivery and require suturing. Injury which involves the anal sphincter is common, diagnosed clinically in 0.4–2.5% of vaginal deliveries where medio-lateral episiotomy is practised and in up to 19% of women following midline episiotomy.

Anal sphincter injury sustained during childbirth is recognized as the leading cause of faecal incontinence in women. Concerns have been expressed that sphincter injuries are missed clinically at time of delivery.

There has been a steady increase in medico-legal cases associated with anal sphincter. Most cases relate to failure to recognize sphincter injury at time of delivery. The aim of this review therefore is to provide a comprehensive review of the risk factors for, diagnosis and evidence for the management of perineal injury to the anal sphincter.

## Classification of perineal injury

Wide variation in the classification of clinically recognized perineal trauma amongst obstetricians has been highlighted by many authors. Since 2001, the same accepted classification has been used by the Royal College of Obstetricians (RCOG UK) and International Consultation on Incontinence (Table 1).

Obstetric anal sphincter injury encompasses both third and fourth degree tears. A third degree perineal tear is defined as a partial or complete disruption of the anal sphincter muscles, which may involve either or both the external (EAS) and internal anal sphincter (IAS) muscles. To standardize classification third degree tear have therefore been classified as 3A, 3B or 3C. A fourth degree tear is defined as a disruption of the anal sphincter muscles with a breach of the rectal mucosa.

## Consequences of anal sphincter injury

Childbirth has a significant impact on the physical and psychological wellbeing of women; with up to 91% of women reporting at least one new symptom eight weeks following delivery. Women with recognized anal sphincter injury have increased morbidity compared with those with first and second-degree tears.

Anal incontinence (AI) is defined as the involuntary loss of flatus or faeces which becomes a social or hygiene problem. It is reported to affect 4–6% of women up to 12 months following delivery which equates to 40 000 mothers affected each year in the UK. 30–50% of women with obstetric anal sphincter injury report symptoms of faecal incontinence, faecal urgency, dyspareunia and perineal pain and symptoms may persist for many years.

Anal incontinence can be affected by many factors including stool consistency and volume, colonic transit, compliance of the rectal reservoir and mental function. The most important factor in maintaining continence however, is an anatomically normal anal sphincter complex and its intact neurological function. It was previously thought neuropathic injury to the pelvic nerves and pudendal nerve was the leading cause of incontinence following childbirth. It has only been since the advent of endoanal ultrasound that sphincter defects were diagnosed in women who were previously diagnosed with a neurogenic cause for their faecal incontinence.

In addition to anal incontinence the longer term consequences of ano-rectal injury include perineal pain, dyspareunia and ano-rectal fistula.

Perineal pain can lead to significant morbidity following vaginal delivery. It can interfere with the women's ability to bond with her newborn. If severe, may lead to problems with voiding of urine and defecation. Perineal pain and dyspareunia have been

## Classification of perineal trauma

Type of tear	Definition
First degree tear	Injury to perineal skin.
Second-degree tear	Injury to perineum involving perineal muscles but not involving the anal sphincter.
Third degree tear	Injury to perineum involving the anal sphincter complex.
3A	Less than 50% of EAS thickness torn.
3B	More than 50% of EAS thickness torn.
3C	Both EAS and IAS torn.
Fourth degree tear	Injury to perineum involving the anal sphincter complex (both EAS & IAS) and anal epithelium.

Table 1

**Gillian Fowler MRCOG** is a Consultant Urogynaecologist at Liverpool Women's Hospital, Liverpool, UK. Conflicts of interest: none declared.

reported in many studies to affect up to 50% of women following anorectal injury and may persist for many years. There is a considerable impact on women's psychosexual health, with many avoiding intercourse for many years.

Abscess formation, wound breakdown and recto-vaginal fistula are serious but fortunately rare consequences of anorectal injury. It is thought that most recto-vaginal fistulae following sphincter repair are caused by failure to recognize the true extent of the initial injury which leads to wound breakdown.

Wound breakdown rates of 10% had previously been reported after sphincter repair. However the recent randomized control trials (RCT) assessing method of repair failed to report any cases of wound breakdown. This may be a reflection of the routine use of broad spectrum antibiotics in protocols for sphincter repair.

### Risk factors for anal sphincter injury

In order to prevent anal sphincter injury, it is important to attempt to identify risk factors. The majority of research assessing risk factors relates to third degree tears. Based on the overall risk of third degree tears as 1% of vaginal deliveries, a number of risk factors have been identified by retrospective studies. These include induction of labour (up to 2%), epidural analgesia (up to 2%), birth weight over 4 kg (up to 2%), persistent occipito-posterior position (up to 3%), primiparity (up to 4%), second stage longer than 1 h (up to 4%), forceps delivery (up to 7%). These risk factors were confirmed by systematic review of 14 studies. Other risk factors, such as shoulder dystocia have been suggested but evidence is contradictory (Box 1).

#### Parity

The first vaginal delivery carries the greatest risk of new onset faecal incontinence (FI) as shown in population-based studies of FI. Each subsequent delivery adds to that risk.

#### Episiotomy

Published evidence on the role of episiotomy is contradictory. Traditional teaching is that episiotomy protects the perineum from uncontrolled trauma during delivery. Although several authors have demonstrated a protective effect with medio-lateral episiotomy, others have reported the converse.

The type of episiotomy is important. Evidence reports medio-lateral episiotomy (favoured in UK and European practice) to have a significantly lower risk of sphincter injury compared with a midline episiotomy (favoured in USA) 2% versus 12%. This confusion may be explained by variations in clinical practice that

### Summary of risk factors for obstetric anal sphincter injury

- Primiparity
- Induction of labour
- Birth weight over 4 kg
- Persistent occipito-posterior position
- Second stage longer than 1 h
- Epidural analgesia

#### Box 1

are not reflected in the studies. There will be differences in the experience of the accoucheur for a normal delivery and the rate of episiotomy also varies. The differences between medical and midwifery staff in conducting a medio-lateral episiotomy have been studied, with doctors performing episiotomies that are longer and at a wider angle compared with midwives. An important learning point is that current evidence is unable to support the routine use of episiotomy to prevent anal sphincter injury.

### Assisted vaginal delivery

The incidence of anal sphincter damage and faecal incontinence symptoms following instrumental delivery is higher than following normal vaginal delivery. Over the last few years, vacuum extraction or ventouse has become the favoured instrument for assisted vaginal delivery rather than forceps. This is based on the evidence from many studies, including a Cochrane review of 10 trials which showed the use of the vacuum extractor instead of forceps was associated with significantly less maternal trauma (odds ratio 0.4, 95% confidence interval 0.3–0.5).

However, compared with forceps delivery, vacuum extraction is significantly more likely to fail with its own implications. (OR 1.7 CI 1.3–2.2). In addition the neonatal risks associated with ventouse delivery are greater, with increased risks of cephalohaematoma and retinal haemorrhage.

### Other risk factors

Studies assessing the risk factors for neuropathy following childbirth have reported injury to be more common in the presence of a prolonged labour particularly the second stage, large size of the foetal head. Many of these factors may result in the need for an assisted vaginal delivery. Further vaginal delivery may result in further pudendal nerve damage.

Many of the risk factors identified are components of normal vaginal delivery and cannot be avoided. The majority of women with these risk factors deliver without anal sphincter injury. Attempts to develop an antenatal risk scoring system for sphincter injury have so far been unsuccessful. Studies are needed to assess the effect of interventions to prevent sphincter injury.

### Protection against anal sphincter injury

Elective caesarean section as opposed to emergency caesarean has been shown to be protective against faecal incontinence. Caesarean section late in the first stage of labour (more than 8 cm dilatation) or in the second stage does not protect the function of the anal sphincter.

Increased awareness of the complications of childbirth is fuelling patient's request for elective caesarean section in otherwise low risk pregnancies. Indeed a survey of female obstetricians in 1996 revealed 31% would themselves request elective caesarean section due to the potential risk of perineal trauma. This view contrasts with the recent NICE guidelines which report an increased risk of maternal morbidity with caesarean section compared with vaginal delivery.

### Clinical recognition of anal sphincter injury

#### Occult anal sphincter injury

In one of the first studies to use endoanal ultrasound following vaginal delivery, Sultan reported anal sphincter injury in up to

35% of women after their first delivery, suggesting that the vast majority of sphincter injuries are not diagnosed clinically at time of delivery. Since this initial work many studies, using endoanal ultrasound in the postpartum period, have reported occult sphincter rates ranging between 6.8% and 28%.

In one study perineal examination by an experienced person was shown to double the clinical detection rate of sphincter injury. This study has also questioned whether anal sphincter injuries are truly “occult” or simply missed clinically at the time of delivery.

There is no question that the addition of postpartum endoanal ultrasound increases the detection of sphincter injury. It is also recognized that symptoms of faecal incontinence following an anal sphincter injury are not commonly reported in the immediate postpartum period and many patients remain asymptomatic for many years. The diagnosis of obstetric anal sphincter damage is therefore often delayed for many years and the opportunity for early intervention, either by physiotherapy or surgical repair, is missed. The importance of early diagnosis has been highlighted in a recent paper by Faltin. Results of this randomized controlled trial show a reduction in faecal incontinence symptoms at 12 months in women who had a surgical repair of sphincter injury diagnosed by endoanal ultrasound at time of delivery compared with no repair.

There is however, limited availability of endoanal ultrasound equipment, trained staff and poor patient acceptability of the technique. Consequently systematic examination of the perineal area, which includes a rectal examination, by experienced staff following delivery remains the method of detecting sphincter injury in clinical practice. This is advocated by both midwifery and obstetric colleges while postpartum endoanal ultrasound remains at the moment a research tool.

### Technique and method of repair of obstetric anal sphincter injury

The RCOG produce national guidelines for the management of anal sphincter injury (updated 2007) based on best available evidence. Together with a recently published Cochrane systematic review on the method of repair of obstetric anal injury it provides recommendations on each aspect of sphincter repair.

#### Setting of repair

Repair of anal sphincter injury should take place in an operating theatre. This provides aseptic conditions and adequate light. Regional or general anaesthesia enables the sphincter muscle to relax, enabling the retracted torn ends to be retrieved and brought together without tension.

#### Antibiotics

Infection following repair is associated with a high risk of anal incontinence and fistula formation. There is no RCT evidence to support the use of antibiotics; indeed a recent Cochrane review looking at antibiotic prophylaxis versus placebo or no antibiotics for fourth degree tears did not find any published RCT's. Intra-operative intravenous and post-operative oral broad spectrum antibiotics have been used in all RCT's assessing different repair techniques. Typical regimes include cefuroxime 1.5 gm and metronidazole 500 mg in theatre, followed by a seven day course of cephalexin 500 mg and metronidazole 500 mg three times daily. Metronidazole in particular is used to cover the risk from anaerobic bacteria of faecal origin.

#### Laxatives

Traditionally women received constipating agents following sphincter repair. This was based on the experience of colorectal surgeons undertaking secondary sphincter repair on patients with faecal incontinence, with the aim to avoid liquid faecal matter contaminating the wound. Primary repair is different from secondary repair; women do not have pre-existing faecal incontinence at time of repair. The use of post-operative laxatives and stool softeners is supported by the opinion that it acts to avoid passing a hard stool which in turn could disrupt the repair.

There is one RCT comparing the outcome of post-operative laxatives versus constipating agents following primary sphincter repair. In the laxative group, patients had a significantly earlier and less painful bowel motion and earlier postnatal discharge. However, there was no difference in the symptomatic or functional outcome of repair between the two regimens.

In published RCT's, stool softeners (lactulose 10 ml three times daily), together with a bulking agent (ispaghula husk, Fybogel one sachet twice daily) were used for 10 days following repair.

#### Technique of repair

The patient is placed in lithotomy. There are two repair techniques which were first described by Sultan and form the basis for many training workshops throughout the UK and in the published RCT's. If injury to the anal mucosa or IAS is identified it should be repaired before the EAS. The anal epithelium is repaired with interrupted 3/0 polyglactin. There is no evidence to guide whether the knots from these sutures should lie within the canal or not. The IAS is repaired with interrupted 3/0 PDS or polyglactin.

#### The overlap technique for repair of EAS (Figure 1)

The torn ends of the external anal sphincter (EAS) should be mobilized free. For an overlap repair approximately 2 cm of one end of the EAS should be laid over the other end in a “double breasted jacket” fashion.

#### The end-to-end repair for EAS (Figure 2)

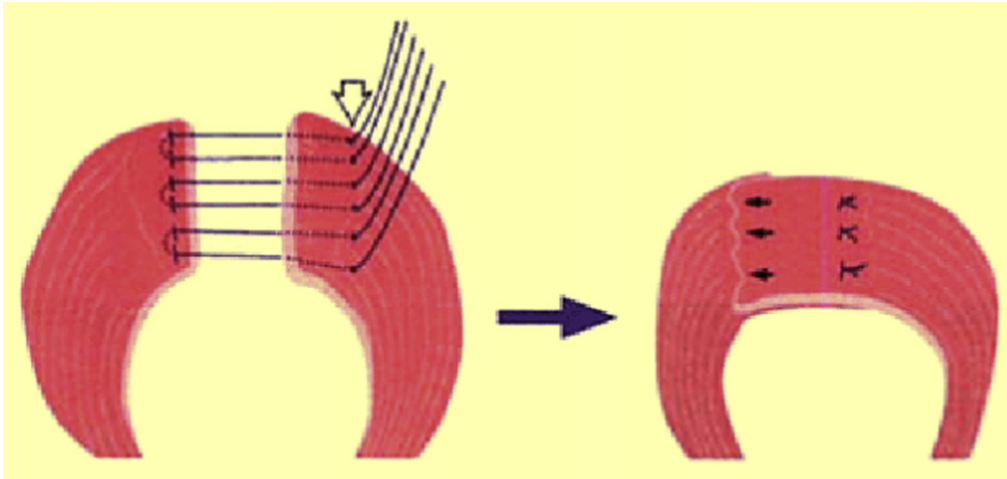
The edges of the torn sphincter are identified and repaired in apposition with three or four interrupted mattress sutures.

The vaginal mucosa and perineal muscles should then be repaired using an absorbable material such as vicryl 2/0 in a continuous non-locking fashion. Finally the perineal skin closed with subcuticular using the same suture material.

#### Which suture material?

There are important differences in suture materials. Monofilament materials such as polydioxanone (PDS) or polypropylene (Prolene) have previously been recommended for sphincter repair. They are less likely to harbour micro-organisms compared with modern braided sutures such as polyglactin (Vicryl). However, prolene is a non-absorbable suture and shown to be associated with an increase risk of suture sinuses and a 30% suture migration rate in one study.

PDS or Vicryl (polyglactin) are both recommended for sphincter repair. Both suture types are absorbable, with complete absorption in 180 and 70 days respectively. Suture materials have only been assessed in one RCT. Braided polyglactin



**Figure 1** Overlap technique for repair of the external anal sphincter.

(coated Vicryl 2/0) and monofilament polydioxanone (PDS 3/0) were compared; with no differences found across the two groups in terms of anal incontinence, perineal pain or suture migration at 12 months follow up.

#### **The external anal sphincter (EAS)**

Traditionally primary anal sphincter repair involved end-to-end repair of the torn ends of the EAS. Since the publication of a retrospective study which suggested improved outcome using an overlap technique, four RCTs have been completed. Women were randomized to end-to-end approximation or overlap repair of the EAS. Recruitment varied between 41 and 112 women. Anal continence scores and quality of life were assessed, together with a mixed combination of ultrasound and anal manometry findings. The duration of follow up varied at 3 or 12 months.

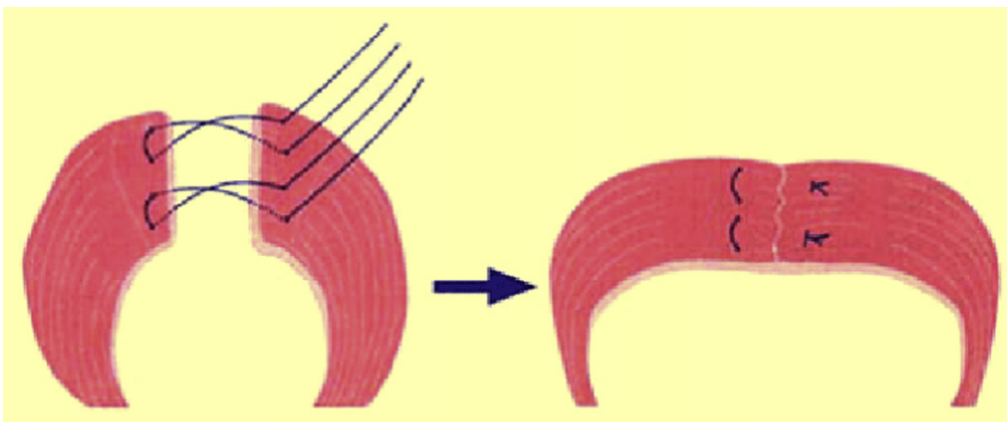
There were also differences in the degree of sphincter injury in women recruited across the RCTs. Three studies included all EAS injuries (3a, 3b and 3c) whereas one study only recruited women with disruption greater than 50% (3b and 3c). In this study, patients with 3b tears had the remaining EAS fibres divided to perform an overlap technique. This contrasts with the other studies where overlap was undertaken without division of EAS fibres. Future studies should include the classification of tears in the randomization. This will allow the outcome of 3A,

3B and 3C tears to be assessed, using an end-to-end or overlap technique.

No significant difference was between the groups in terms of faecal incontinence rates in three of the RCTs. One study showed a better outcome with an overlap repair. In addition to the difference in approach to the overlap technique in 3b tears in this study, there was a potential difference in the experience of the clinician undertaking the repair. In contrast to the other studies, sphincter injuries were repaired by three trained clinicians rather one of a larger number of trained clinicians as in the other studies. As such, the benefit of an overlap repair shown in this RCT, may not be applicable across other obstetric units.

#### **The internal anal sphincter (IAS)**

The original description of the overlap technique includes separate repair of the internal anal sphincter. The IAS has a role in maintaining continence and studies have shown increased anal incontinence in women with both IAS and EAS injury compared with EAS injury alone. However, it is recognized that identification of the IAS is not always possible in clinical practise, indeed it was not identified separately from the EAS in all of the RCTs. Whether the IAS should be repaired separately from the EAS is not clear from current evidence but if identified it would seem advisable to repair it separately.



**Figure 2** End-to-end approximation of the external anal sphincter.

### Who should undertake sphincter repair?

Traditionally anal sphincter injury repair was carried out at the time of injury by trainee obstetricians. It is recognized that inexperienced attempts at anal sphincter repair can contribute to maternal morbidity. As a result in some units repair would be delayed and repair to be undertaken by colorectal surgeons, experienced in secondary sphincter repair.

Deficiencies in the training of both obstetricians and their trainees in the repair of sphincter injury have been highlighted. As a result many workshops are now available throughout the UK. Attendance at a hands-on training workshop has been shown to increase both awareness of perineal anatomy and recognition of anal sphincter injury.

The RCOG recommend that sphincter repair is performed by appropriately trained obstetricians but do not define what training should involve. There are differences in experience of operators in the RCTs of third degree tear repair. In three of the four published RCTs, large numbers of clinicians were trained in workshops to perform the repairs. In contrast, another study used three senior operators who undertook the repairs. There is no sub-analysis in these RCTs to assess the effect of operator experience on outcome. Available evidence supports the view of the RCOG that repair by an appropriately trained obstetrician is likely to provide consistent, high standard repair with better patient outcomes.

### Outcome of primary anal sphincter injury repair

Endoanal ultrasound (EAUS) and neurophysiological tests together with patient symptoms of anal incontinence have been used to assess the outcome of primary anal sphincter repair. The development of incontinence does not appear to be directly related to neuropathy as shown by EMG and PNTM (pudendal nerve terminal motor latency). Poor outcome has been shown to be related to a persistent sphincter defect detected on EAUS.

The RCTs comparing end-to-end approximation with overlap repair have shown that 60–80% of women to be asymptomatic at 12 months following primary repair of obstetric anal sphincter injury. Persistent defects occur in 19–36% of women, most of which affect the EAS.

Based on the evidence from the four RCTs published, patients who have an anal sphincter tear repaired using either end-to-end or overlap technique with a similar intra and post-operative protocol as described above can be counselled that the outcome of primary repair is likely to be good and the most common symptom experienced is incontinence to flatus.

### Follow up after obstetric anal sphincter injury

Women should be followed up at 6 weeks postpartum, ideally by a consultant with an interest in anorectal injuries. The delivery details and the anal sphincter injury should be discussed. Direct and specific questioning about symptoms of faecal incontinence, particularly faecal urgency and associated symptoms of dyspareunia and perineal pain, should be made. The use of a validated faecal incontinence questionnaire is helpful and can be posted to the patient prior to the appointment.

It is important the women are warned of the possible sequelae of anal sphincter injury. They may not be symptomatic at the time of review but should be advised on how to obtain advice if

symptoms develop at a later date. Undertaking EAUS and manometry, where available, will help with the counselling about mode of delivery in future pregnancy.

Symptomatic women should be sent to a specialist centre or to a colorectal surgeon. Further management of faecal incontinence symptoms will depend on the results of EAUS and manometry. Symptomatic women with the sphincter defect may be offered a secondary sphincter repair and any future delivery would be by caesarean section. In women without a sphincter defect or with milder symptoms, benefit has been shown by dietary manipulation to regulate bowel function and advice on avoiding gas-producing foods. Incontinence of loose stool is the common distressing symptom. Medications can be used to firm the stool by using constipating agents such as loperamide or codeine phosphate, or bulking agents.

Many clinicians advocate the involvement of a physiotherapist to teach pelvic floor exercises (PFE) in the postpartum management of women with anal sphincter injury. The evidence for PFE following anal sphincter injury is sparse. One study reported lower anal incontinence rates at one year in women taught PFE by a physiotherapist following third degree tear but lacked a control group.

### Future pregnancy and mode of delivery

A plan for the management of subsequent pregnancies and the mode of delivery should be part of the follow up for women sustaining anal sphincter injury. An outline of the author's current practice has been previously published. There are no Cochrane reviews or RCTs to guide the mode of delivery following obstetric anal sphincter injury and as such opinions differ between clinicians.

There is limited data regarding the likelihood of recurrent sphincter injury if vaginal delivery occurs in a subsequent pregnancy. Attempts to develop an antenatal risk scoring system for sphincter injury have so far been unsuccessful. Studies assessing vaginal delivery following third degree tear have shown worsening faecal incontinence symptoms in 17–24% of women. This is particularly true of women who had transient incontinence after the index delivery.

Review of all women with a previous anal sphincter injury by a senior clinician at booking is essential. It is important to review details about the sphincter injury, anal incontinence symptoms and, if available, the results of endoanal ultrasound and manometry. It is important to remember that patients with transient incontinence following third degree tear are likely to have worsening faecal incontinence symptoms after a further vaginal delivery. The RCOG guidelines recommend that all women who have sustained an anal sphincter injury in a previous pregnancy should be counselled regarding the risk of developing anal incontinence or worsening symptoms with subsequent vaginal delivery. Women who are symptomatic or who have abnormal endoanal ultrasound or manometry, should be offered the option of elective caesarean section. If asymptomatic, there is no clear evidence as to the best mode of delivery.

The woman's own experience of labour or other obstetric related factors will often influence her preference about the mode of delivery and women who have had a difficult or traumatic delivery may request elective caesarean section.

## Conclusions

Obstetric anal sphincter injury is the leading cause of faecal incontinence in women. These injuries may be clinically recognized as a third or fourth degree tear or occult, diagnosed using ultrasound. Repair of injuries recognized at delivery by an experienced operator, using a standard protocol and either end-to-end or overlap techniques of the external sphincter has been proven to greatly improve the outcome for women by reducing symptoms of faecal incontinence and the persistence of sphincter defects seen on follow up ultrasound. ◆

## FURTHER READING

- Andrews V, Sultan AH, Thakar R, Jones PW. Occult anal sphincter injuries – myth or reality? *BJOG* 2006 Feb; **113**: 195–200.
- Faltin DL, Boulvain M, Floris LA, Irion O. Diagnosis of anal sphincter tears to prevent fecal incontinence: a randomized controlled trial. *Obstet Gynecol* 2005 Jul; **106**: 6–13.
- Faltin DL, Sangalli MR, Roche B, Floris L, Boulvain M, Weil A. Does a second delivery increase the risk of anal incontinence? *BJOG* 2001 Jul; **108**: 684–8.
- Fernando RJ, Sultan AH, Kettle C, Radley S, Jones P, O'Brien PM. Repair techniques for obstetric anal sphincter injuries: a randomized controlled trial. *Obstet Gynecol* 2006; **107**: 1261–8.
- Fernando RJ, Sultan AH, Kettle C, Thakar R, Radley S. Methods of repair for obstetric anal sphincter injury. *Cochrane Database Syst Rev*; 2006; (3): CD002866.
- Fitzpatrick M, Behan M, O'Connell PR, O'Herlihy C. A randomized clinical trial comparing primary overlap with approximation repair of third-degree obstetric tears. *Am J Obstet Gynecol* 2000; **183**: 1220–4.
- Fowler G, Williams A, Murphy G, Taylor K, Wood C, Adams E. How to set up a perineal clinic. *Obstet Gynecol* 2009; **11**: 129–32.
- Garcia V, Rogers RG, Kim SS, Hall RJ, Kammerer-Doak DN. Primary repair of obstetric anal sphincter laceration: a randomized trial of two surgical techniques. *Am J Obstet Gynecol* 2005; **192**: 1697–701.
- Royal College of Obstetricians & Gynaecologists. Management of third and fourth degree perineal tears. RCOG Press, 2007 (RCOG Guideline No.29).
- Sultan AH, Kamm MA, Hudson CN, Bartram CI. Third degree obstetric anal sphincter tears: risk factors and outcome of primary repair. *BMJ* 1994; **308**: 887–91.

- Sultan AH, Monga A, Kumar D, Stanton SL. Primary repair of obstetric anal sphincter rupture using the overlap technique. *Br J Obstet Gynaecol* 1999; **106**: 318–23.
- Thakar R, Sultan AH, Fernando RJ, Monga A, Stanton S. Can workshops on obstetric anal sphincter rupture change practice? *Int Urogynecol J Pelvic Floor Dysfunct* 2001; **12**.
- Tincello DG, Williams A, Fowler GE, Adams EJ, Richmond DH, Alfirevic Z. Differences in episiotomy technique between midwives and doctors. *BJOG* 2003 Dec; **110**: 1041–4.
- Williams A, Adams EJ, Tincello DG, Alfirevic Z, Walkinshaw SA, Richmond DH. How to repair an anal sphincter injury after vaginal delivery: results of a randomised controlled trial. *BJOG* 2006 Feb; **113**: 201–7.
- Williams A, Tincello DG, White S, Adams EJ, Alfirevic Z, Richmond DH. Risk scoring system for prediction of obstetric anal sphincter injury. *BJOG* 2005 Aug; **112**: 1066–9.

## Practice points

- Trained operators should undertake primary anal sphincter repair in theatre using a standard intra and post-operative protocol.
- RCT evidence suggests outcome of overlap and end-to-end techniques for repairing the EAS are equivalent. Where possible, the IAS should be repaired separately from the EAS.
- There is no difference in the outcome between monofilament sutures (PDS) and braided sutures such as Vicryl for primary sphincter repair.
- Women should be counselled about the future risk of faecal incontinence.
- Review should occur at 6 weeks following delivery. EAUS and manometry should occur where available. Symptomatic women should be referred to a colorectal surgeon.
- Women should be reviewed early in future pregnancies. Symptomatic women or those with abnormal EAUS or neurophysiology tests should be offered delivery by caesarean section.