Keywords Childbirth/Anal sphincter/Perineal tears/Incontinence

This article has been double-blind peer reviewed

In this article...

- Anatomy and physiology of the anal sphincter complex
- Classification and incidence of perineal tears in women
- Physical and psychological effects of obstetric anal sphincter injuries

Obstetric anal sphincter injury: causes, effects and management

Key points

1 **Obstetric anal sphincter injuries (OASIs) are perineal tears that involve the anal sphincter**

2 **During childbirth some women sustain OASI and may develop symptoms such as pain and urinary or faecal incontinence**

3 **To minimise the impact of OASIs, it is vital to reduce the risk of them occurring in the first place and detect them when they have occurred**

4 **Women are often embarrassed to talk to health professionals about continence or sexual function issues**

5 **Pregnant women who have previously sustained OASIs should be helped to choose between Caesarean section and vaginal birth**

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Abstract Women who sustain obstetric anal sphincter injuries often experience burdensome short- and long-term effects that can include pain, faecal and/or urinary incontinence and sexual dysfunction. Health professionals involved in childbirth need to be aware of risk factors and symptoms to ensure women are adequately assessed and treated. This article explains how the anal sphincter complex works; defines perineal tears; outlines the prevalence of sphincter injuries, risks factors, symptoms and consequences; and describes how they are managed at the author's workplace, Croydon University Hospital.

Citation Ness W (2017) Obstetric anal sphincter injury: causes, effects and management. *Nursing Times* [online]; 113: 5, 28-32.

In a woman's life, childbirth is often a watershed moment that gives rise to new life and opens up new experiences. After giving birth, women usually feel that their bodies gradually go back to functioning as they did before pregnancy – with perhaps a few changes in body shape. However, this is not always the case.

While giving birth, some women sustain perineal trauma that can have short- and long-term physical and psychological consequences. In approximately 5% of these women, the trauma involves the anal sphincter, resulting in third- or fourth-degree tears, which are also referred to as obstetric anal sphincter injuries (OASIs).

OASI can cause symptoms such as pain and faecal and/or urinary incontinence (FI/UI), which can negatively affect women's quality of life. Pregnant women are often unaware that OASI might happen when they give birth, and when it does, they are often not informed about the consequences.

The anal sphincter complex

Before looking at what happens during childbirth and how OASIs can cause issues such as incontinence, we need to understand the anatomy and physiology of the anal sphincters (Fig 1). These simple structures perform an extraordinary complex function (Emmanuel, 2004).

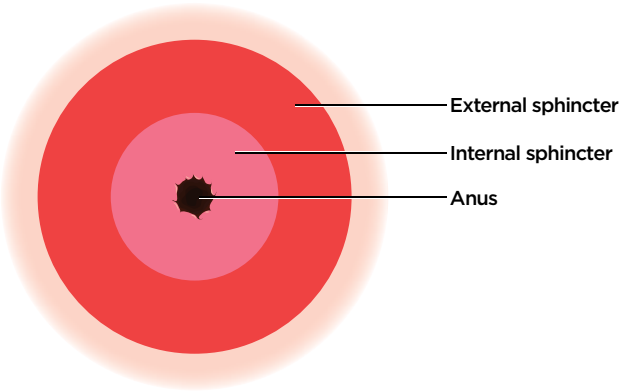
The anal canal is approximately 4cm long and extends from the anal verge to the anorectal ring, which is defined as the proximal level of the levator – external anal sphincter (EAS) complex (Thakar and Fenner, 2007).

The internal anal sphincter (IAS) is a thickened continuation of the circular smooth muscle of the bowel that ends in a well-defined rounded edge situated 6-8mm above the anal margin, at the junction of the superficial and subcutaneous part of the EAS (Thakar and Fenner, 2007). The IAS is controlled by involuntary muscles – a weak IAS can result in passive FI and/or flatus incontinence (that is, FI or flatulent gas incontinence) occurring without the person being aware of it.

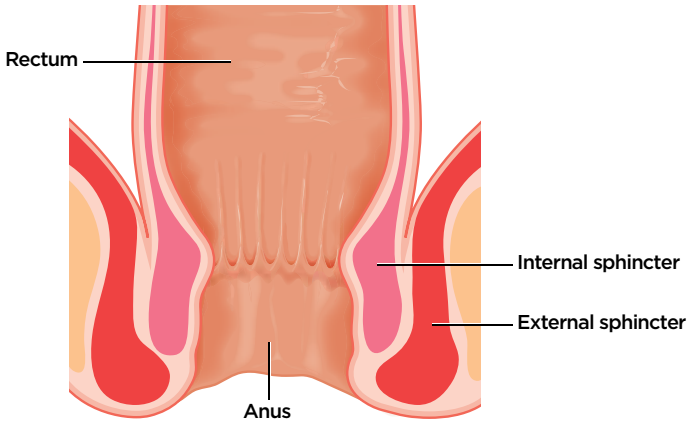
The EAS is divided into three parts: subcutaneous, superficial and deep; in women it is shorter anteriorly than in men (Thakar and Fenner, 2007). The EAS is under voluntary muscle control, and a weak EAS can result in urge FI – that is, the person

Fig 1. **Anal sphincter anatomy**

1a. View across 'rings of muscle'



1b. Cross-section



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urgently needs to go to the toilet but cannot control the EAS well enough to get there in time.

The 'closing reflex' induces the anal sphincter (IAS and EAS) to snap shut at the end of rectal evacuation. Patients can enhance it by squeezing their EAS.

The recto-anal inhibitory reflex occurs when there is a distension of the rectum resulting in IAS relaxation and EAS contraction; the rectum fills and a 'call to stool' can be felt. This lasts <10 seconds, allowing the anal canal to distinguish solids from liquids and from flatus, which is important in maintaining continence (Emmanuel, 2004).

Perineal tears

Weakness of, or damage to, the anal sphincters is the most common cause of FI and, in women, anal sphincter damage is often caused by childbirth. During childbirth, many women sustain tears in the perineal area (the area between the vaginal opening and the anus). These can involve the:

- Perineal skin;
- Vaginal mucosa;
- Pelvic floor muscles;
- EAS and IAS muscles;
- Rectal mucosa (lining of the bowel).

When tears extend to the anal sphincter, they are called OASIs.

Box 1 outlines the classification of perineal tears devised by Sultan (1999), which has been adopted by the International Consultation on Incontinence and the Royal College of Obstetricians and Gynaecologists (RCOG, 2015).

Approximately a third of all women having first-time vaginal deliveries will sustain sphincter damage and a third of these will develop new symptoms of FI (Sultan, 1999). According to Farrar et al (2014), severe damage involving injury to the anal sphincters has been reported in up to 18% of vaginal deliveries.

In the UK, the incidence of OASI in first-time vaginal births is estimated to be around 6.1% (Thiagamoorthy et al, 2014). Over the last decade, there has been a steady rise in the rate of OASIs (Naidu et al, 2017). In England, the rate of OASI in first-time vaginal births tripled from 1.8% to 5.9% between 2000 and 2012 – this could, however, be partly due to an increase in detection, rather than in actual numbers, because health professionals are more aware of OASI and better trained in recognising it (Gurol-Urganci et al, 2013).

Box 1. **Classification of perineal tears**

- **First-degree tear:** injury to the perineal skin and/or vaginal mucosa
- **Second-degree tear:** injury to the perineum, involving perineal muscles but not the anal sphincter
- **Third-degree tear:** injury to the perineum involving the anal sphincter complex:
  - **Grade 3a tear:** <50% of EAS thickness torn
  - **Grade 3b tear:** >50% of EAS thickness torn
  - **Grade 3c tear:** both EAS and IAS torn
- **Fourth-degree tear:** injury to the perineum involving the anal sphincter complex (EAS and IAS) and anorectal mucosa

OASI encompass both third- and fourth-degree perineal tears.

EAS = external anal sphincter. IAS = internal anal sphincter. OASI = obstetric anal sphincter injury.

Sources: Royal College of Obstetricians and Gynacologists (2015); Sultan (1999)

Minimising risks factors

It is increasingly acknowledged that childbirth is a risk factor on its own, both for UI and FI. The risk of developing anal incontinence increases with OASI (Scheer et al, 2008). In a large retrospective study, McPherson et al (2014) demonstrated that the following independently increased the incidence of OASI:

- Forceps delivery;
- Ventouse delivery;
- African-Caribbean ethnicity;
- Water immersion (in first stage of labour can help with pain relief);
- Water birth (birth of baby in water).

In water immersion, the position of the mother precludes surveillance of the perineum, which may lead to unrecognised tears during birth.

The following factors have been shown to reduce the incidence of OASI:

- Home birth;
- Smoking;

- Vaginal parity of >0;
- South-Asian descent (McPherson et al, 2014).

Modifying various risk factors and taking into account anatomical factors can reduce the risk of OASIs. In vaginal delivery, Kapoor et al (2015) recommend a safely angled episiotomy at 60 degrees, when indicated, to relieve pressure on the central part of the posterior perineum, and a slow and controlled delivery of the head.

In the first stage of labour, women with a short perineal length (<30mm) are more likely to sustain perineal tears and are also at higher risk of sustaining an OASI. A recent study by Naidu et al (2017) found that perineal support during vaginal delivery was associated with a significant reduction in the rates of OASIs. Warm compressions during the second stage of labour also reduces the risk of OASI; this involves holding a warm compress on the perineum continuously during and between contractions (RCOG, 2015).

Symptoms

OASIs are associated with significant short- and long-term morbidity. Once women have sustained OASI, they are at increased risk of developing pain and FI, either in the postnatal period or later in life. FI is often under-reported and under-recognised and, being associated with significant medical, hygiene and social problems (Walsh and Grivell, 2015), has a negative impact on quality of life.

Following childbirth and OASI, women may experience UI or FI – in fact, this might happen even if they have not sustained OASI. Some women remain asymptomatic, while others experience any or all of the following symptoms:

- Stress and/or urge UI;
- Flatus incontinence;
- FI;
- Haemorrhoids;
- Dyspareunia;
- Sexual dysfunction;
- Vesico-vaginal fistulas;
- Pelvic organ prolapse (Priddis et al, 2013; Bagade and Mackenzie, 2010; Rathfisch et al, 2010; Tin et al, 2010; Pauls et al, 2007).

These symptoms can all lead to long-term psychological and physical sequelae.

Adequate detection of anal sphincter injuries is vital to minimise their impact on women (Cornell et al, 2016). Unfortunately, many women do not seek medical help because they feel embarrassed (Fernando et al, 2013). It is therefore all the more important for health professionals to adopt active case finding after birth or further down the line – especially in women who have had a third- or fourth-degree tears – so they can be treated as quickly as possible.

QUICK FACT

Up to 18%
Vaginal deliveries in which severe anal sphincter injury is reported

Post-partum sexual dysfunction

Apart from FI and UI, women may also experience problems with sexual function, which they are often too embarrassed to mention during medical appointments. A focus on the newborn baby is another reason why they might not talk about these problems. O'Reilly et al (2009) found that, as a result of severe perineal trauma, women experienced an altered perception of their sexual self; they described feeling that they had aged prematurely and that they were a failure, as symptoms meant they were unable to fulfil their partner's sexual needs.

Sexual dysfunction is classified as disorders of sexual desire, arousal, orgasm and pain; in the post-partum period, the most common disorder appears to be pain. There is a lack of professional awareness of, expertise in and recognition of sexual dysfunction that causes distress to the individual (Abdool et al, 2009). Health professionals who see women with OASI need to be aware of this potential issue and ask their patients not only about continence, but also about sexual function.

Enhancing professional training

Training in digital rectal assessment can improve the detection of OASI, thereby minimising the risk of FI (Andrews et al, 2006). Midwives and doctors should attend focused multidisciplinary training, which should be mandatory, to enhance their understanding of perineal anatomy and their skills at recognising anal sphincter trauma (Thiagamoorthy et al, 2014).

Andrews et al (2009) carried out an audit to evaluate the effectiveness of a course in OASI management at imparting knowledge. The course was delivered by experts in the field and included practical sessions undertaken using models of anal sphincters and cadaveric pigs' anal sphincters. Anonymous questionnaires completed before the course, and eight weeks after it, showed that participants classified OASI more accurately and adopted evidence-based practice after the course. This provides evidence that structured training can be effective in changing clinical practice.

A multidisciplinary perineal clinic

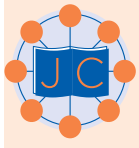
At Croydon Health Services Trust, a dedicated, consultant-led multidisciplinary perineal clinic is held on a weekly basis for patients who have sustained OASI. The team comprises a midwife, a specialist registrar and a consultant urogynaecologist who has a special interest in this area as well as in endo-anal scanning. For patients who have urinary and/or faecal continence problems, the team can arrange direct access to a colorectal nurse specialist and a urogynaecology nurse specialist.

Assessment

Patients who have sustained third- or fourth-degree tears are seen in the clinic three months after delivery; this gives their wounds time to heal and their immediate symptoms of incontinence time to recede. If the wounds are healing well and patients are asymptomatic, they will be discharged and seen halfway through their next pregnancy to decide on what mode of delivery would be best. If patients have problems with their wounds and need closer follow up, they are seen by the midwife on a regular basis at the clinic, with access to the consultant urogynaecologist if needed.

In the clinic, women are assessed for any ongoing symptoms, such dyspareunia and UI and/or FI, through direct questioning, validated questionnaires and physical examination. All patients undergo anal manometry and endo-anal ultrasound so the team can objectively assess their anal sphincters.

Anorectal physiology tests are key in assessing patients with pelvic floor symptoms, as they provide a clinically



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Box 2. Risks associated with vaginal delivery

- Bleeding
- Uterine infection
- Tear of tissue around the vagina, perineum and anus
- Complications requiring the use of forceps, vacuum extraction or emergency Caesarean delivery
- Blood clots
- Urinary/faecal incontinence
- Death (risk estimated to be <1 in 10,000)
- Injury to the baby

meaningful, quantitative measure of specific anorectal functions. In patients with FI, manometry complements anal endosonography in defining functional weakness of one or both sphincter muscles, and it can predict the likely response to biofeedback training (Sultan et al, 2017). However, physiological measurements can only be correctly interpreted in light of the patient's symptoms, physical examination and radiological investigations.

Management

After subjective and objective patient assessment, a decision will be made about what treatment is required. Many women will be asymptomatic and not need any treatment but they are advised that, during any following pregnancy, they will need to discuss the mode of delivery with their obstetrician.

Some women experience perineal/anal pain. If assessment has shown that there might be a vesicovaginal fistula, patients are referred to the MDT pelvic floor clinic, where the urogynaecology consultant, colorectal consultant and colorectal nurse specialist will reassess them and decide what should happen next. The next step could be further assessment with magnetic resonance imaging, conservative treatment ('watch and wait'), examination under anaesthetic, or surgery to treat the fistula.

Women who have bladder symptoms only are referred to the urogynaecology nurse specialist for further assessment and treatment, which will normally include personalised pelvic floor exercises, bladder retraining and advice on fluid intake and other lifestyle changes.

Women who have bowel or bowel and bladder symptoms are seen by the colorectal nurse specialist. The bowel symptoms can range from faecal urgency to urge and/or passive FI of differing degrees. Patients are further assessed to find out what their most burdensome symptoms are and how these are affecting their lives, taking into account what their bowel function was like before giving birth. A personalised treatment plan that focuses on the most burdensome symptoms is developed. It usually comprises:

- Biofeedback (to suppress the urge to defecate);
- A tailored course of pelvic floor exercises, dietary and lifestyle changes (including how to reduce wind if flatus incontinence is a problem);
- Explanations on defecatory dynamics;
- Advice on containment products, such as pads or anal inserts.

The management plan is similar if the patient also has bladder symptoms.

Choice of delivery mode after OASI

Women who have sustained OASI during a birth are often keen to have a Caesarean section for the next birth, either because they feel that another vaginal birth would exacerbate their symptoms or because they had such a bad experience the first time, they do not wish to go through the same thing again.

Pregnant women and their obstetricians face a challenge when deciding what mode of delivery is best: a planned Caesarean section, which avoids the risk of another anal sphincter injury but carries its own morbidity, or a vaginal birth with a high risk of new perineal tears (Edozien et al, 2014). Boxes 2 and 3 list the risks associated with vaginal delivery and Caesarean section, respectively.

All women who have sustained an OASI should be counselled regarding the mode of delivery and this should be clearly documented in their notes. If a woman is symptomatic or shows abnormally low anorectal manometric pressures and/or endo-anal defects on ultrasound, an elective Caesarean section may be considered (Sultan and Thakar, 2002).

Scheer et al (2009) carried out a prospective study involving 73 pregnant women who had previously sustained OASI. Those who had a sonographic defect of the external sphincter of >30 degrees accompanied by an incremental maximum squeeze pressure of <20mmHg were offered a Caesarean section; all other women were advised to have a vaginal delivery. Short-term follow-up showed that the women who underwent vaginal delivery had no significant deterioration in anal sphincter function or quality of life.

Box 3. Risks associated with Caesarean section

- Infection of the wound
- Infection of the womb lining
- Excess bleeding
- Damage to the bladder or ureter
- Decreased bowel function
- Respiratory complications
- Longer hospital stay and recovery time
- Reactions to anaesthesia
- Additional surgical interventions
- Risk to future fertility and babies
- Adhesions
- Death (risk estimated to be <1 in 2,500)
- Premature birth (if the due date was not accurately calculated, the baby could be delivered too early)
- Breathing problems in the baby including transient tachypnea (abnormally fast breathing during the first few days after birth)

Fig 1 (page 32) shows the protocol used at Croydon University Hospital for managing pregnancies after OASI. Symptomatic women who have low manometric pressures and a defect to the EAS have two options:

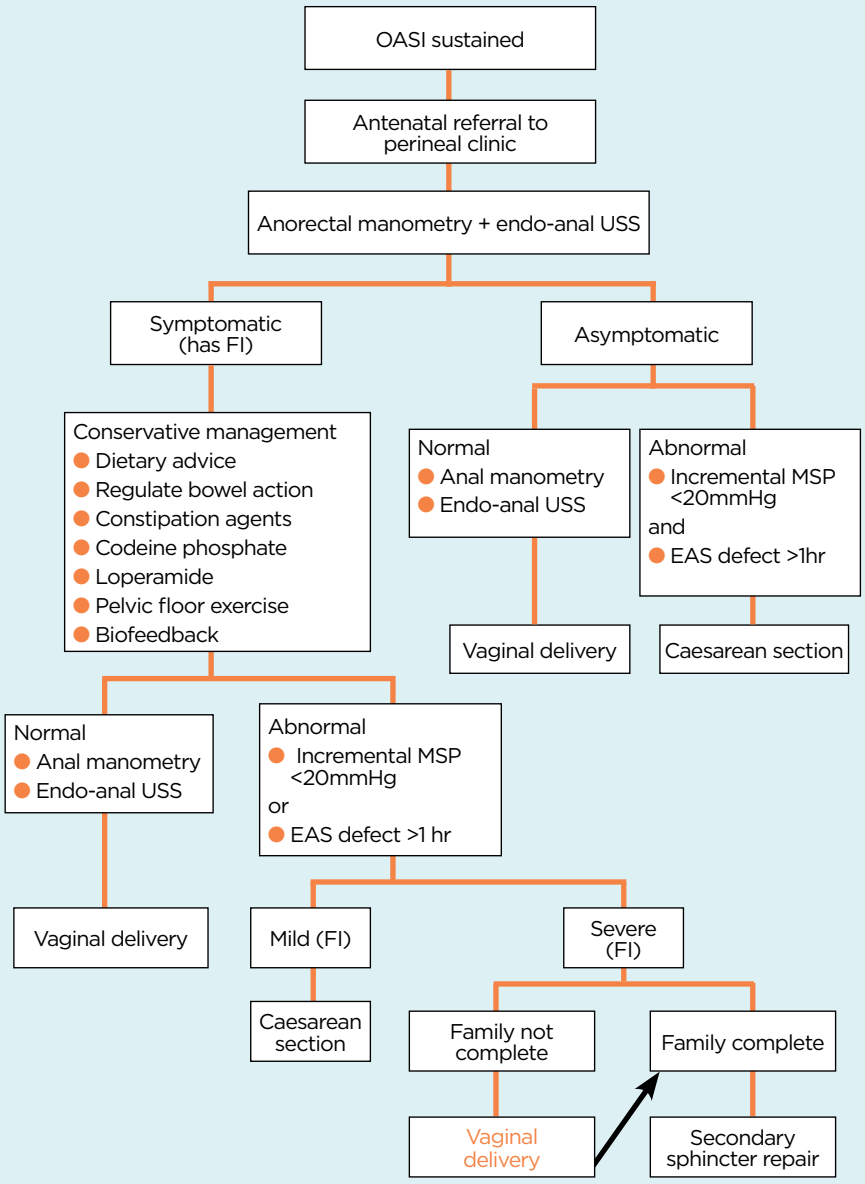
- If their symptoms of FI are mild they should have a Caesarean section to reduce the risk of making these symptoms worse;
- If they have severe symptoms of FI they should have a vaginal delivery, as their symptoms are unlikely to get worse and later, once their family is complete, they should have a secondary sphincter repair.

Conclusion

Sustaining perineal trauma during childbirth can have a significant negative impact on women physically, psychologically, emotionally and socially. It is important that, where possible, the risk of OASI, is reduced and that, if OASI does occur, it is recognised and treated appropriately, as this will reduce the incidence of burdensome symptoms such as FI. For this to happen there needs to be better hands-on training of all health professionals involved in childbirth.

Ideally, women who sustain OASI need to be seen in a perineal clinic where they can be assessed by experts and have access to adequate, timely treatment and support, before their symptoms have too great a negative effect on their quality of life. **NT**

Fig 1. **Protocol for managing pregnancies after OASI**



EAS = external anal sphincter. FI = faecal incontinence. MSP = maximum squeeze pressure. OASI = obstetric anal sphincter injury. USS = ultrasound.

Source: Croydon Health Services Trust.

References

Abdool Z et al (2009) Postpartum female sexual function: a review. *European Journal of Obstetrics, Gynecology, and Reproductive Biology;* 145: 2, 133-137.

Andrews V et al (2009) Structured hands-on training in repair of obstetric anal sphincter injuries (OASIS): an audit of clinical practice. *International Urogynecology Journal and Pelvic Floor Dysfunction;* 20: 2, 193-199.

Andrews V et al (2006) Occult anal sphincter injuries: myth or reality? *British Journal of Obstetrics and Gynaecology;* 113: 2, 195-200.

Bagade P, Mackenzie S (2010) Outcomes from medium term follow-up of patients with third and fourth degree perineal tears. *Journal of Obstetrics and Gynaecology;* 30: 6, 609-612.

Cornell K et al (2016) The effect of implementing a new guideline and operative pro forma on the detection and management of third- and fourth-degree perineal tears. *International Journal of Women's Health;* 8: 131-135.

Edozien LC et al (2014) Impact of third- and fourth-degree perineal tears at first birth on subsequent pregnancy outcomes: a cohort study. *British Journal of Obstetrics and Gynaecology;* 121: 13, 1695-1703.

Emmanuel A (2004) The physiology of defaecation and continence. In: Norton C, Chelvanayagam S (eds) *Bowel Continence Nursing.* Beaconsfield: Beaconsfield Publishers.

Farrar D et al (2014) Interventions for women in subsequent pregnancies following obstetric anal sphincter injury to reduce the risk of recurrent injury and associated harms. *Cochrane Database of Systematic Reviews;* 11: CD010374.

Fernando RJ et al (2013) Methods of repair for obstetric anal sphincter injury. *Cochrane Database of Systematic Reviews;* 12: CD002866.

Gurol-Urganci I et al (2013) Third- and fourth-degree perineal tears among primiparous women in England between 2000 and 2012: time trends and risk factors. *British Journal of Obstetrics and Gynaecology;* 120: 12, 1516-1525.

Kapoor DS et al (2015) Obstetric anal sphincter injuries: review of anatomical factors and modifiable second stage interventions. *International Urogynecology Journal;* 26: 12, 1725-1734.

McPherson KC et al (2014) Can the risk of obstetric anal sphincter injuries (OASIs) be predicted using a risk-scoring system? *BMC Research Notes;* 7: 471.

Naidu M et al (2017) Reducing obstetric anal sphincter injuries using perineal support: our preliminary experience. *International Urogynecology Journal;* 28: 3, 381-389.

O'Reilly R et al (2009) Women's experiences of recovery from childbirth: focus on pelvis problems that extend beyond the puerperium. *Journal of Clinical Nursing;* 18: 14, 2013-2019.

Pauls RN et al (2007) Sexual function following anal sphincteroplasty for fecal incontinence. *American Journal of Obstetrics and Gynecology;* 197: 6, 618.e1-618.e16.

Priddis H et al (2013) Women's experiences following severe perianal trauma: a meta-ethnographic synthesis. *Journal of Advanced Nursing;* 69: 4, 748-759.

Rathfisch G et al (2010) Effects of perineal trauma on postpartum sexual function. *Journal of Advanced Nursing;* 66: 12, 2640-2649.

Royal College of Obstetricians and Gynaecologists (2015) *The Management of Third- and Fourth-Degree Perineal Tears.* Bit.ly/RCOGPerinealTears

Scheer I et al (2009) Mode of delivery after previous obstetric anal sphincter injuries (OASIS): a reappraisal? *International Urogynecology Journal including Pelvic Floor Dysfunction;* 20: 9, 1095-1101.

Scheer I et al (2008) Urinary incontinence after obstetric anal sphincter injuries (OASIS): Is there a relationship? *International Urogynecology Journal including Pelvic Floor Dysfunction;* 19: 2, 179-183.

Sultan AH (1999) Obstetric perineal injury and anal incontinence. *Clinical Risk;* 5: 193-196.

Sultan AH et al (2017) An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female anorectal dysfunction. *Neurourology and Urodynamics;* 36: 1, 10-34.

Sultan AH, Thakar R (2002) Lower genital tract and anal sphincter trauma. *Best Practice and Research: Clinical Obstetrics and Gynaecology;* 2002; 16: 1, 99-115.

Thakar R, Fenner DE (2007) Anatomy of the perineum and anal sphincter. In: Sultan AH et al (eds) *Perineal and Anal Sphincter Trauma.* London: Springer.

Thiagamoorthy G et al (2014) National survey of perineal trauma and its subsequent management in the United Kingdom. *International Urogynecology Journal;* 25: 12, 1621-1627.

Tin RYT et al (2010) The prevalence of anal incontinence in post-partum women following obstetrical anal sphincter injury. *International Urogynaecology Journal;* 21: 8, 927-932.

Walsh KA, Grivell RM (2015) Use of endoanal ultrasound for reducing the risk of complications related to anal sphincter injury after vaginal birth. *Cochrane Database of Systematic Reviews;* 10: CD010826.

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