Risk factors for and management of obstetric anal sphincter injury

Aswini A Balachandran
Kandice Ka Woon Wong
Ranee Thakar

Abstract

Obstetric anal sphincter injuries (OASIs) include both third and fourth degree perineal tears. They are regarded as the most severe form of perineal trauma and may cause anal incontinence, perineal pain and dyspareunia. The risks of developing OASIs are increased by certain maternal, fetal, intrapartum and delivery factors. Diagnosis is made by clinical examination which can be improved by formal training. Primary repair is best performed immediately after childbirth. It is recommended that the external anal sphincter (EAS) and internal anal sphincter (IAS) should be repaired with 3-0 polydioxanone suture (PDS) and the technique of repair of the varies based on grade of tear. Post-operative care involves routine antibiotics, laxative and pain-relief. Patients should be reviewed 6–12 weeks postpartum in a dedicated clinic with a clinician with a special interest in OASIs.

Keywords anal sphincter; manual perineal protection; OASIs; OASIs repair; obstetric anal sphincter injury; third-degree tear

Introduction

Vaginal delivery is often associated with perineal trauma. It can occur spontaneously or secondary to an extension of an episiotomy. The current classification of the perineal trauma adopted by the Royal College of Obstetricians and Gynaecologists (RCOG) and the International Consultation on Incontinence have divided perineal trauma into four sub-categories.

1. First-degree: injury to the perineal skin and/or vaginal mucosa
2. Second-degree: injury to the perineum involving the perineal muscles but not involving the anal sphincter
3. Third-degree: injury to the perineum involving the anal sphincter complex:
   - 3a: Less than 50% of external anal sphincter (EAS) thickness torn
   - 3b: More than 50% of EAS thickness torn
   - 3c: Both EAS and internal anal sphincter (IAS) torn
4. Fourth-degree: injury to the perineum involving the anal sphincter complex (EAS and IAS) and anorectal mucosa

Obstetric anal sphincter injuries (OASIs) encompass both third and fourth degree perineal tears. They are regarded as the most severe form of perineal trauma associated with long-term consequences such as anal incontinence and perineal and anal pain. In England, it is estimated that the reported rate of OASI injury in primigravida has tripled from 1.8% to 5.9% between 2000 and 2012. This can have significant impact on the healthcare system due to required appointments and treatment. In addition, litigation due to such injury and its long-term consequences has increased.

Consequences of OASI

OASIs are associated with significant long-term maternal morbidity which can have a negative impact on quality of life and psychological consequences. Symptoms of OASIs include anal incontinence, perineal pain, and dyspareunia.

Anal incontinence affects 5% of women up to one year after childbirth. Women with OASIs are significantly more likely to suffer from faecal incontinence, faecal urgency and flatal incontinence compared to women without anal sphincter injuries. Fourth degree tears result in more severe symptoms and are associated with a greater likelihood of faecal incontinence when compared with third degree tears (25% vs 11.5%).

Perineal pain is common after OASI and may be short or long-lasting. Short-term perineal pain may be caused by bruising, oedema, wound infection and breakdown. Persistent perineal pain may lead to concurrent problems such as urinary retention, defaecatory and sexual dysfunction. Sultan et al have demonstrated that after an OASI up to 50% of women develop perineal pain and dyspareunia, which may last for several years.

Rectovaginal fistula is an uncommon complication following OASI. The reported incidence of rectovaginal fistula after a fourth-degree tear ranges from 0.4% to 3%. Rectovaginal fistulae are challenging to treat and treatment may include a permanent colostomy.

Risk factors

Risk factors associated with OASI can be sub-divided into maternal, fetal and intrapartum and delivery factors. However, it has not been possible to use a risk-scoring system to predict whether or not the anal sphincter will be damaged at childbirth. The risk of developing OASI is increased by the following risk factors:

- Maternal factors
  - Nulliparity
  - Asian ethnicity
- Intrapartum and delivery factors
  - Instrumental delivery – More commonly with forceps than with vacuum-assisted vaginal deliveries
  - Midline episiotomy
  - Shoulder dystocia
  - Prolonged second stage of labour
- Fetal factors
  - Fetal birthweight >4 kg
  - Occipito-posterior position

Aswini A Balachandran *MBBS MRCOG Consultant Urogynaecologist, Medway Maritime Hospital, Kent, UK; Croydon University Hospital, Croydon, UK. Conflicts of interest: none declared.*

Kandice Ka Woon Wong *MBBS MRCOG Urogynaecology Subspecialty Registrar, Croydon University Hospital, Croydon, UK. Conflicts of interest: none declared.*

Ranee Thakar *MBBS MRCOG Consultant Urogynaecologist, Croydon University Hospital, Croydon, UK. Conflicts of interest: none declared.*

Women with previous OASI are at an increased risk of recurrence. A meta-analysis found that advanced maternal age, birth weight more than 4 kg, forceps and ventouse birth are predictors for recurrent OASI. The use of mediolateral episiotomy could decrease the risk of recurrence by 80%.

In addition, specific factors increase the risk of OASI at vaginal birth after caesarean section including advanced maternal age, increased infant birth weight and an urgent category of initial caesarean section.

Diagnosis

Following a vaginal delivery, a gentle, careful systematic examination of the perineum should be conducted including a digital rectal examination for all women prior to repair. Inspection of the perineum should be conducted with adequate lighting and analgesia and include inspection of the distal posterior vagina and for the presence of a third degree tear behind an "intact perineum". Examination should be performed using the examiner's dominant index finger inserted into the anus and the ipsilateral thumb inserted into the vagina. A 'pill-rolling' motion should then be performed by both fingers to assess the thickness of the anal sphincter. The detection of sphincter injuries is improved with increased awareness and formal training amongst clinical staff. The detection of OASI has been reported to increase from 11% to 24.5% when the examination is repeated by a trained clinician.

Management

The mainstay of treatment of OASI remains surgical repair carried out as soon as possible after childbirth, termed 'primary repair'. The repair may be delayed by up to 12 hours if there is minimal bleeding with no difference in outcome on anal incontinence and pelvic floor symptoms. Repair should be performed as soon as possible. The majority of women (60–80%) are asymptomatic 12 months following an OASI repair. However, physical repair of the anal sphincter muscle does not always result in symptomatic cure. The prevalence of anal incontinence following primary repair of OASI ranges between 15% and 61%. It is important that an appropriately trained clinician perform the repair. A combination of misdiagnosis of tears, poor repair technique, inexperienced clinicians and inadequate postoperative management have been attributed to presence of anal symptoms and poorer outcomes in the long-term.

Surgical technique

Repair of the anal sphincter should be performed under regional or general anaesthesia in an operating theatre under an aseptic environment. Regional anaesthesia (spinal or epidural) or general anaesthesia provides analgesia and relaxation of the anal sphincter, which allows the full extent of the tear to be evaluated, thus optimizing the repair. The operating theatre offers the benefit of optimal lighting, appropriate exposure and equipment thereby providing the ideal environment to perform a repair. We recommend a specially prepared instrument tray containing a Weislander self-retaining retractor, four Allis tissue forceps, McIndoe scissor and a needle holder. Deep retractors such as Deavers are useful when there are associated paravaginal tears. Monofilament (e.g. 3-0 polydioxanone suture (PDS)) or braided suture (e.g. 2-0 polyglactin (Vicryl)) are recommended for the repair of the anal sphincter regardless of technique. Complete absorption of PDS takes longer than Vicryl with 50% tensile strength lasting more than 3 months compared to 3 weeks respectively. A randomized trial of 112 women showed no difference in suture-related morbidity between Vicryl and PDS at 6 weeks. Suture ends should be cut short and knots buried under overlying superficial perineal muscles to minimize suture migration and to reduce perineal pain or discomfort. Intraoperative single dose antibiotics are also recommended. Second generation cephalosporins administered intraoperatively have been shown to significantly reduce perineal wound infection from 24.2% to 8.2%.

Repair of the anal mucosa

The torn edges of the anal mucosa should be approximated using continuous Vicryl 3-0 s sutures. Polyglactin sutures cause less irritation and discomfort than PDS sutures. Haemostatic sutures such as 'figure-of-eight' sutures should not be used due to the risk of development of ischaemia of the anorectal mucosa.

Repair of internal anal sphincter (IAS)

The internal anal sphincter (IAS) is a continuation of the rectal muscle under autonomous control and is responsible for maintaining anal continence at rest. Damage to the IAS muscle may result in passive faecal incontinence. The IAS is identified as a thin muscle which is pale pink in appearance in close proximity to the anal mucosa. It is recommended that the edges of the IAS should be estimated using the 'end-to-end' technique using braided or monofilament sutures. Interrupted or mattress sutures should be used to suture the IAS. Identifying and repairing the IAS has been associated with improved anal incontinence at 1 year while persistent IAS defects seen on endoanal ultrasound have been associated with an increase in anal incontinence and a worse degree of symptoms compared to women without IAS defects.

Repair of the external anal sphincter (EAS)

The EAS has inherent tone and is normally under tonic contraction. When torn, the EAS ends retract within its capsular sheath and are found posterior-laterally to the tear. There are two recommended techniques for the repair of a damaged EAS: the end-to-end technique or the overlap technique. In the end-to-end technique, the torn edges of the EAS are approximated end-to-end and sutured using two or three mattress sutures. It can be used to suture both Grade 3a, 3b and 4 tears. The overlap method requires the torn edges of the EAS to be sutured by overlapping one end of the muscle over the other. An overlap repair can only be performed in the event of a full thickness Grade 3b tear where there is full length and thickness disruption of the EAS muscle. It requires 1–1.5 cm of the muscle ends to be free to allow for the edges to overlap. A Cochrane review of six trials involving 588 women, found only one study in favour of the overlap technique. At 12 months, a meta-analysis of 156 women found statistically significant lower incidence of faecal urgency and anal incontinence in the overlap with no difference in perineal pain, dyspareunia or flatal incontinence. Overall, there was no difference in quality of life at 1 year between both surgical techniques. The Royal College of Obstetricians and Gynaecologists (RCOG) recommend that a clinician can perform either technique to repair the EAS based on clinical discretion. Surgical knots should

be buried beneath the superficial perineal muscles. This minimizes the risk of knot and suture migration to the skin.

After the anal sphincter and/or the anal mucosal repair, the perineal body and vaginal mucosa should be repaired using the continuous Vicryl 2-0 rapide sutures. Subcuticular sutures using 2-0 Vicryl rapide should be used to close the perineal skin. A vaginal and rectal exam should be performed at the completion of the repair to ensure that sutures have not been inserted through the anorectal mucosa. If a suture is identified it should be removed.

Post-operative care

Post-operative antibiotics after repair of OASI are recommended to reduce the development of postpartum perineal wound infection, wound dehiscence and the development of rectovaginal fistulae. Routine analgesia is required to reduce maternal morbidity and reduce hospital stay. Non-steroidal anti-inflammatory drugs (NSAIDs) in combination with paracetamol are an effective first line treatment for perineal pain. A Cochrane review found that rectal analgesia such as diclofenac suppository reduces perineal trauma related pain during the first 24 hours following birth and results in less additional analgesia used in the first 48 hours post-delivery. However, this should be avoided in 4th degree tears. Opioid analgesia should be avoided to prevent constipation.

An indwelling urinary catheter on free drainage should be inserted during repair. This should be removed after about 24 hours unless midwifery staff can ensure that spontaneous voiding occurs at least every 3–4 hours without developing urinary retention. After an OASI there may be a delay in the return of bladder sensation after regional anaesthesia and due to perineal discomfort, increasing the risk of urinary retention. A study by Glavind and Bjork found that 33% of women with OASI were found to develop postpartum urinary retention compared with 1% of the total population of postpartum women.

The use of laxative agents and stool softeners such as Lactulose are recommended post-operatively to avoid constipation and potential disruption of the repair from the passage of hard stool. Laxatives are associated with earlier and less painful first bowel motion and an earlier hospital discharge. Laxatives also reduce the risk of wound dehiscence and are recommended for 10 days after the repair. Bulking agents should be avoided due to the increased risk of faecal incontinence in the immediate postpartum period. It is important to ensure women with OASI have evacuated their bowel within 48 hours after delivery. If this has not occurred, early intervention with lactulose, mineral oil, milk of magnesia or other oral stimulant should be given. Post-operative physiotherapy is recommended after OASI repair.

Cornell et al reported that the implementation of an OASIs management guideline and the use of an operative proforma resulted in significant improvement in the management OASIs with a significant increase in the use of the recommended suture material (48% vs 80%, $p = 0.002$), postoperative antibiotics (78% vs 99%, $p = 0.001$), postoperative catheterization (52% vs 90%, $p < 0.001$) and in-patient physiotherapy consultation (44% vs 97%, $p = 0.001$). Variations in local guideline in the use of antibiotics, laxative, physiotherapy and post-operative follow-up plans should be based on local requirements.

Follow-up

There is no optimal method of follow-up recommended after an OASI. The RCOG generally recommended that women should be reviewed 6–12 weeks postpartum in a dedicated clinic with a clinician with a special interest in OASI. The women are reviewed to debrief about the injury sustained, assess symptoms, offer treatment and advice on future mode of delivery. In the event of persistent anal incontinence or pain, the women should be referred to a specialist gynaecologist or colorectal surgeon.

In specialist clinics, further investigations may be performed. Endoanal ultrasonography is currently the gold-standard to evaluate the anatomy of the anal sphincter. This allows for the full-extent of damage to the external and internal anal sphincter to be visualized. Anal sphincter muscle function can be assessed by anorectal manometry which measures the anal canal length and resting and squeeze pressure of anal canal. Both investigative modalities are particularly useful in women with persistent symptoms of faecal incontinence, faecal urgency and flatal incontinence. Endoanal ultrasound and anal manometry are an important aid to decision-making regarding future modes of delivery.

Prevention of perineal trauma

It is important to prevent perineal trauma during childbirth. Identifying and modifying risk factors would reduce perineal trauma. However, certain antenatal risk factors such as BMI and fetal weight are unmodifiable at the time of delivery. Therefore techniques to prevent perineal trauma antenatally and during labour and delivery would be beneficial to a large number of women.

Perineal massage

Perineal massage aims to reduce muscular resistance by increasing the flexibility of the perineal muscles and allowing the perineum to stretch without tearing during delivery. It is recommended in the third trimester of pregnancy. A Cochrane review demonstrated in women having their first vaginal birth, perineal massage from 35 weeks was associated with a 9% reduction in perineal trauma that required surgical repair. However, there was no difference in the rates of first, second, third and fourth degree perineal tears. The technique is generally well-accepted by women. A systematic review and meta-analysis of randomized controlled trials with 3467 patients found that antenatal perineal massage is associated with a lower risk of sever perineal trauma and postpartum complications.

Labour and birth positions

Women are encouraged to labour in many different positions. Women may adopt position of lateral recumbent, kneeling, squatting, standing, supine or semi-recumbent in labour and delivery. However, the optimal position of delivery remains up for debate. The supine or semi-recumbent position of birth particularly in lithotomy commonly used in an obstetric setting is often considered medicalization of childbirth. It allows for easy access to the women's abdomen for fetal heart rate monitoring as well as manual protection of the perineum by the accoucher. A Cochrane review of 30 trials showed no difference in OASI rates in different positions of labour and delivery.

Use of warm perineal compress

Perineal warm compress is often recommended in the second stage of labour to reduce perineal trauma. A Cochrane review demonstrated that women who had a warm compress used during the second stage of labour were 50% less likely to develop third and fourth degree tears. Warm compresses are a simple, cheap, effective option and should be incorporated in the second stage of labour. However, the optimal temperature of such compresses is not known and clinicians should be aware of the risks of burns from hot water, and the risks of infection.

Manual perineal protection (MPP)

Manual perineal protection (MPP) refers to the technique of supporting the woman's perineum during crowning of the fetal head and delivery of the posterior shoulder. Its potential benefit continues to be controversial amongst healthcare professionals. A systematic review and meta-analysis of 3 RCTs found that there was no protective effect of MPP in the prevention of OASIs. However, these RCTs used a variety of techniques of perineal support with significant variation in method, training and supervision. Compliance between 'hands-off' versus 'hands-poised' was also often poor amongst healthcare professionals with caregivers often instinctively supporting the perineum at crowning. The authors also performed a meta-analysis of non-randomized controlled trials of more than 75,000 deliveries and it showed a reduction of OASIs by more than 50% from 5% to 2%. Importantly, these studies were not only restricted to low-risk pregnancies as in the RCTs but also included women who were at risk of developing an OASI.

Laine et al have demonstrated the reduction of OASIs from 4.03% to 1.17% as a result of manual perineal protection. In this technique perineal support continues through the crowning of the fetal head and delivery of the shoulders. It is well-known that delivery of the shoulders is when an OASI may occur. The accoucher applies firm pressure on the fetal head with their non-dominant hand to control the speed of crowning. Simultaneously, the thumb and index finger of the dominant hand support the perineum and the flexed third finger is used to grip on the baby's chin. As the fetal head is crowing, the women is asked stop active pushing and asked to do fast upper-costal breathing without pushing. Whilst the fetal head is advancing, the perineal ring is pushed under the baby's chin. Episiotomy is only recommended if required based on clinical assessment at the time of delivery.

See Box 1.

Role of episiotomy

Episiotomies are performed to enlarge the vaginal outlet with the aim to prevent large perineal tears including OASI. Mediolateral episiotomies are defined as an episiotomy performed between 40 and 60 degrees from the midline. Episiotomies performed either midline or close to the midline carry a higher incidence of OASI. It has been shown that for every 6 degrees away from the midline, there is a 50% reduction in OASI. However, if the episiotomy angle is too wide and nearly horizontal the protective effect is lost because the pressure on the perineum is not relieved, resulting in a nine-fold increase in OASI. Episiotomies at 60°, longer than 17 mm and with a depth greater than 16 mm are associated with a lower rate of OASI. A systematic study found that mediolateral episiotomies had a beneficial effect in the prevention of OASI. However, evidence from RCTs suggests that routine prophylactic episiotomy does not prevent severe perineal and vaginal tears. We would therefore recommend a selective use of episiotomy in women having a spontaneous vaginal delivery. In an instrumental delivery (forceps and vacuum), a mediolateral episiotomy is significantly protective for OASI. It is a protective against OASI in women who undergo vaginal birth after caesarean. A mediolateral episiotomy also decreased the risk of a recurrent OASI by 80%.

The OASI care bundle

The OASI care bundle, a joint project between the Royal College of Obstetricians and Gynaecologists and the Royal College of Midwives has recently been completed. A stepped wedge cluster randomized trial was used across 16 units in the United Kingdom. The implementation of OASI care bundle reduced third and fourth degree rates without affecting caesarean section rates or episiotomy use. This care bundle included informing women about OASI and identifying what can be done to minimize her risk, performing an episiotomy when required, manual perineal protection and a thorough rectal examination after vaginal delivery to assess perineal trauma. Nineteen women who received OASI care bundle as part of their maternity care were interviewed to explore their experiences of the care bundle. They did not find any of the care bundle elements invasive or having a negative impact on their labour experience. They reported that manual perineal protection is acceptable, and it was a positive and supportive experience. They did not experience their episiotomy as a negative experience. This study also highlighted the urge to provide more information about perineal trauma to women antenatally and postnatally in terms of risk, prevention and recovery.

Box 1

Management of subsequent pregnancies

With the rise in the rate of OASI there is a need for evidence based recommendations to help guide the management of women who have previously sustained an OASI in their subsequent pregnancy and delivery. It is recognized that a minority of women who have had an OASI develop worsening faecal symptoms after second vaginal delivery without a subsequent OASI. It is important to identify women who are at risk of worsening symptoms in order to advise about mode of delivery. However, there are no systematic reviews or randomized controlled trials which help guide recommendations regarding subsequent mode of delivery following an OASI.

The RCOG Green-Top Guideline recommends that women with a previous OASI should be reviewed in an obstetrician-led antenatal clinic and be counselled regarding mode of delivery. However, there is little evidence in the literature regarding the best mode of delivery after sustaining an OASI. Robust evidence detailing which specific maternal or fetal risk factors should lead to a recommendation for an elective caesarean section in a subsequent pregnancy is lacking. It is difficult to balance the risks of sustaining another anal sphincter injury with another vaginal birth with the risks of a planned caesarean section. A large cohort study, by Edozien, of 639,402 women who had vaginal first births in England demonstrated the risk of OASI to be 7.2% for women with a previous OASI compared to 1.3% for women without a previous OASI. Although a caesarean section

will prevent this recurrence of a repeat OASI or any perineal tear, it is associated with an increased maternal and neonatal morbidity. A study assessing outcomes between caesarean sections and vaginal deliveries found that the prevalence of morbidity after a vaginal delivery was 4.2% when compared to 11.3% after a caesarean section. Episiotomies are only recommended if clinically indicated as previously discussed and prophylactic episiotomies have not been found to be protective.

Symptoms of anal incontinence and investigative modalities such as anal manometry and endoanal ultrasound are useful if assisting clinicians and patients in this decision-making process. A prospective observational study of 146 women who had sustained OASI were reviewed 3 months postpartum following OASI and in the second half of a subsequent pregnancy. They found that smaller sphincter defects (less than 'one hour' of a clock face) were associated with better postpartum mean incremental maximum squeeze pressures and St Mark's Incontinence Scores in a subsequent pregnancy ($p = 0.04$ and $p = 0.01$, respectively). In our perineal clinic, all women who sustained an OASI were seen 3 months following the birth. Women who sustain a third degree tear who remain asymptomatic of anal incontinence and have normal anal manometry studies and no abnormal sphincter defects on endoanal ultrasound postnatally do not need to be reviewed again in the subsequent pregnancy and can be recommended to have a vaginal delivery. We follow a set protocol of management of women in a subsequent pregnancy and advice on mode of delivery is given based on this protocol. Vaginal delivery is recommended if the woman presents with mild or no symptoms, an EAS scaror defect of less than 1 hour on the clock face, and with a squeeze incremental pressure greater than 20 mmHg. Elective caesarean section is recommended for women with an EAS scar greater than 1 hour on the clock face and/or a squeeze incremental pressure of less than 20 mmHg who are asymptomatic or have mild symptoms. Patients with severe symptoms with similar endoanal scan and anal manometry results are recommended to have a vaginal delivery followed by a secondary anal sphincter repair once their family is complete. It would be reasonable to offer caesarean section to all women who have sustained a fourth degree tear in centres which cannot offer endoanal ultrasound and anal manometry. However, in units where these investigations are available, counselling regarding the mode of delivery should be offered on an individual basis. All discussion regarding subsequent mode of delivery should be carefully documented in the woman's notes.

Conclusion

Obstetric anal sphincter injuries have a serious effect on maternal morbidity and long-term quality of life if undetected and/or repaired poorly. Clinicians should recognize the risk factors for OASI and proactive intrapartum management has been shown to result in the reduction of risk. Trained clinicians are more likely to provide a consistent, successful repair reducing maternal morbidity and litigation associated with OASI. ◆

FURTHER READING

Abdelhakim AM, Eldesouky E, Elmagd IA, et al. Antenatal perineal massage benefits in reducing perineal trauma and postpartum morbidities: a systematic review and meta-analysis of randomized controlled trials. *Int Urogynecol J* 2020 Sep; **31:** 1735–45.

Fernando R, Sultan AH, Kettle C, Thakar R. Methods of repair for obstetric anal sphincter injury. *Cochrane Database Syst Rev* 2013; **8:** CD002866.

Harvey MA, Pierce M. Obstetrical anal sphincter injuries (OASIS): prevention, recognition and repair. *JOGC* 2015; **330:** 1131–48.

Jha S, Parker V. Risk factors for recurrent obstetric anal sphincter injury (rOASI): a systematic review and meta-analysis. *Int Urogynecol J* 2016 Jun; **27:** 849–57.

Jordan PA, Naidu M, Thakar R, Sultan AH. Effect of subsequent vaginal delivery on bowel symptoms and anorectal function in women who sustained a previous obstetric anal sphincter injury. *Int Urogynecol J* 2018; **29:** 1570–88.

Okeahialam NA, Thakar R, Sultan AH. Effect of a subsequent pregnancy on anal sphincter integrity and function after obstetric anal sphincter injury (OASI). *Int Urogynecol J* 2021 Jul; **32:** 1719–26.

Royal College of Obstetricians and Gynaecologists Green-top guideline No 29: the management of third and fourth degree perineal tears. UK RCOG, 2015.

Sultan AH, Thakar R, Fenner DE. Perineal and anal sphincter trauma. London: Springer, 2009; 1–52.

Taithongchai A, Thakar R, Sultan AH. Management of subsequent pregnancies following fourth-degree obstetric anal sphincter injuries (OASIS). *Eur J Obstet Gynecol Reprod Biol* 2020 Jul; **250:** 80–5.

Practice points

- Symptoms of OASI include anal incontinence, perineal pain, dyspareunia and rectovaginal fistula
- Diagnosis of OASI should be performed by a 'pill-rolling' motion using both fingers to assess the thickness of the anal sphincter.
- Monofilament (e.g., 3-0 polydioxanone suture (PDS)) or braided suture (e.g. 2-0 polyglactin (Vicryl)) are recommended for the repair of the anal sphincter, regardless of technique.
- The anal mucosa should be approximated using continuous Vicryl 3-0 sutures.
- An overlap repair can only be performed on the EAS in the event of a full thickness Grade 3b tear where there is full length and thickness disruption of the EAS muscle.
- Endoanal ultrasonography and anorectal manometry are useful in the management of subsequent pregnancy in women with persistent symptoms of faecal incontinence, faecal urgency and flatal incontinence.
- The implementation of the OASI care bundle reduces third and fourth degree rates without affecting caesarean section rates or episiotomy use.