Recurrent late miscarriages may be due to a weak (sometimes called an incompetent) cervix that shortens or opens too early in pregnancy. Cervical cerclage involves placing a stitch around the upper part of the cervix to keep it closed; the operation may be carried out through the vagina, or through the abdomen, as an open or laparoscopic ('keyhole') procedure.

Introduction

This overview has been prepared to assist members of the Interventional Procedures Advisory Committee (IPAC) in making recommendations about the safety and efficacy of an interventional procedure. It is based on a rapid review of the medical literature and specialist opinion. It should not be regarded as a definitive assessment of the procedure.

Date prepared

This overview was prepared in January 2007.

Procedure name

- Laparoscopic cerclage for prevention of recurrent pregnancy loss due to cervical incompetence

Specialty societies

- British Maternal and Fetal Medicine Society
- Royal College of Obstetricians and Gynaecologists

Description

Indications

Cervical incompetence may be due to previous obstetric or gynaecological trauma or a congenital weakness of the cervix. It is characterised by painless dilatation of the cervix in the second or third trimester, followed by premature
rupture of the membranes and preterm delivery or miscarriage. The condition is usually diagnosed after one or more late second trimester or early third trimester pregnancy losses.

Laparoscopic cervical cerclage is indicated for cervical incompetence that is not amenable to a conventional transvaginal procedure, or following previous failed elective vaginal cerclage.

**Current treatment and alternatives**

Cervical incompetence is traditionally treated by transvaginal cervical cerclage, which is usually done under general or regional anaesthesia. This involves placing a stitch of strong thread or tape around the cervix, via the vagina, and tightening it to keep the cervix closed. There are two main techniques; the Shirodkar technique involves placing the stitch high up around the cervix, as close as possible to the level of the internal cervical os, while the McDonald ‘purse string’ technique involves inserting the stitch around the intravaginal portion of the cervix. The procedure is typically performed at the end of the first trimester or the beginning of the second trimester, and the stitch is usually removed at around 37 weeks’ gestation.

If a previous transvaginal cervical cerclage has failed or it is not technically possible (for example, if the cervix is very short), a transabdominal approach may be used. This conventionally involves an open laparotomy to place the stitch around the cervix. The baby is delivered by caesarean section.

**What the procedure involves**

Laparoscopic cervical cerclage can be performed during pregnancy or as an interval procedure in non-pregnant women. It is performed under general anaesthesia. In a non-pregnant woman, a dilator may be initially inserted into the cervix through the vagina for uterine manipulation. The peritoneal cavity is first insufflated with carbon dioxide through a needle inserted into the umbilicus. A number of small incisions are made to provide access for the laparoscope and surgical instruments. The bladder is dissected away from the uterus and a ligature of tape or mesh is secured around the cervical isthmus, above the cardinal and uterosacral ligaments. As with the open transabdominal approach, caesarean section is necessary to deliver the baby.

**Efficacy**

The efficacy evidence presented in this overview relates to two case series\(^1\)\(^-\)\(^2\), describing the experience of 31 women (32 pregnancies).

The Specialist Advisers listed key efficacy outcomes as take home baby rate, prolongation of pregnancy, reduction in perioperative morbidity and perinatal morbidity, operating times and blood loss.

Two case series studies reported live birth rates of 95% (19/20) and 83% (10/12)\(^1\)\(^-\)\(^2\). The proportion of term deliveries (defined in one study as 38 weeks or more and not defined in the other study) was 70% (14/20) and 67% (8/12),
respectively. In the case series study of 20 women, one pregnancy loss occurred after premature rupture of membranes at 19 weeks’ gestation. Mean operating times were 55 and 68 minutes and the mean blood loss was estimated to be less than 100 ml and less than 40 ml, respectively.

**Safety**

The safety evidence presented in this overview relates to three case series, describing the experience of 34 women.

The Specialist Advisers noted that there are additional theoretical concerns when the procedure is done in pregnancy. They stated that potential adverse events included premature rupture of membranes, uterine rupture, haemorrhage, intrauterine death of fetus, extreme preterm delivery, maternal infection, bowel and bladder damage, the need to perform laparotomy, hysterotomy or hysterectomy and difficulties with evacuation of a non-viable pregnancy.

There was one report of uterine vessel injury in each of two case series, including a total of 23 women. In another case series of 11 women, there was one case of small bowel injury and subsequent pelvic abscess. No other surgical complications were described.

**Literature review**

**Rapid review of literature**

The medical literature was searched to identify studies and reviews relevant to laparoscopic cerclage for prevention of recurrent pregnancy loss due to cervical incompetence. Searches were conducted via the following databases, covering the period from their commencement to 5 January 2007: Medline, PreMedline, EMBASE, Cochrane Library and other databases. Trial registries and the Internet were also searched. No language restriction was applied to the searches. (See appendix C for details of search strategy.)

The following selection criteria (Table 1) were applied to the abstracts identified by the literature search. Where these criteria could not be determined from the abstracts the full paper was retrieved.
Table 1 Inclusion criteria for identification of relevant studies

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication type</td>
<td>Clinical studies were included. Emphasis was placed on identifying good quality studies. Abstracts were excluded where no clinical outcomes were reported, or where the paper was a review, editorial, laboratory or animal study. Conference abstracts were also excluded because of the difficulty of appraising methodology.</td>
</tr>
<tr>
<td>Patient</td>
<td>Patients with an incompetent cervix not amenable to transvaginal cervical cerclage.</td>
</tr>
<tr>
<td>Intervention/test</td>
<td>Laparoscopic cervical cerclage</td>
</tr>
<tr>
<td>Outcome</td>
<td>Articles were retrieved if the abstract contained information relevant to the safety and/or efficacy.</td>
</tr>
<tr>
<td>Language</td>
<td>Non-English-language articles were excluded unless they were thought to add substantively to the English-language evidence base.</td>
</tr>
</tbody>
</table>

List of studies included in the overview

This overview is based on four case series studies, including a total of 36 women, and four case reports.¹⁻⁸

Other studies that were considered to be relevant to the procedure but were not included in the main extraction table (table 2) have been listed in appendix A.

Existing reviews on this procedure

There were no published reviews on laparoscopic cervical cerclage identified at the time of the literature search.

A Cochrane review on cerclage for preventing pregnancy loss in women was published in 2003⁹. The review identified six trials with a total of 2175 women. Four trials compared prophylactic cerclage with no cerclage and two trials examined the role of therapeutic cerclage when ultrasound examination revealed short cervix. All cerclages were inserted transvaginally and five of the six studies specified that the McDonald technique was used for all patients. The review stated that there was no overall reduction in pregnancy loss and preterm delivery rates, although a small reduction in births under 33 weeks' gestation was seen in the largest trial (relative risk 0.75, 95% confidence interval 0.58–0.98). The authors concluded that ‘there may be a role for cervical cerclage for women considered ‘at very high risk’ of second trimester miscarriage due to a cervical factor e.g. greater than two second trimester losses or progressive shortening of the cervix on ultrasound. However, predicting those women who will miscarry due to a cervical factor remains elusive and many women may be treated unnecessarily. The numbers involved in randomised studies are too few to draw firm conclusions.’

Related NICE guidance

There is no NICE guidance related to this procedure (appendix B).
### Table 2 Summary of key efficacy and safety findings on laparoscopic cerclage for prevention of recurrent pregnancy loss due to cervical incompetence

Abbreviations used: CT, computed tomography

<table>
<thead>
<tr>
<th>Study details</th>
<th>Key efficacy findings</th>
<th>Key safety findings</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cho C-H (2003)</strong>&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Mean operating time = 55 minutes (range 40–75)</td>
<td>In one patient, laceration of a uterine vein occurred and blood loss was estimated at 150 ml. Haemostasis was achieved by applying clips, and the woman had a successful term delivery.</td>
<td>Retrospective review.</td>
</tr>
<tr>
<td><strong>Case series</strong></td>
<td>Mean hospital stay = 4 days</td>
<td></td>
<td>Patient selection not described.</td>
</tr>
<tr>
<td>South Korea</td>
<td>Mean estimated blood loss = &lt;100 ml</td>
<td></td>
<td>It is difficult to know how meaningful before and after comparisons are; “regression to mean” phenomenon may account for some of the difference.</td>
</tr>
<tr>
<td>Study period: not stated</td>
<td>Obstetric outcomes in 20 women before and after laparoscopic cerclage</td>
<td></td>
<td>The authors stated that they had some difficulties with manipulating the impregnated uterus. They stated that gestational age is important and that elective laparoscopic cervical cerclage should be done between 10 and 14 weeks’ gestation.</td>
</tr>
<tr>
<td>n = 20</td>
<td></td>
<td></td>
<td>The authors stated that post-conception cerclage is more advisable than cerclage in non-pregnant women, because it is done after the fetus has been evaluated ultrasonographically for obvious abnormalities and after the risk of spontaneous abortion has passed. In pregnant women, the wall of the uterine isthmus is softer than in non-pregnant women. The authors considered that experience with pre-conception cerclage was still insufficient.</td>
</tr>
<tr>
<td>Population: Pregnant women in whom it was not technically possible to perform transvaginal cerclage</td>
<td>Obstetric outcomes in 20 women before and after laparoscopic cerclage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean patient age = 31 years (range 27–39)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean gestational age at cerclage placement = 12 weeks (range 11–14)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indications: All patients had severe cervical deformities, including very short cervixes with multiple cervical defects due to extensive conisation and deep fornical lacerations. Sixteen women had marked scarring after failed vaginal cerclage and 11 had had at least one or two successive second trimester pregnancy losses. None had a history of congenital anomalies or diethylstilbestrol exposure.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technique: Mersilene polyester tape used (Ethicon Inc., Somerville, NJ, USA); carbon dioxide infused into peritoneum; prophylactic antibiotics and tocolytic agents were routinely administered for 2 days postoperatively.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Follow-up: 5 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conflict of interest: none stated</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Study Details

**Mingione MJ (2003)**

**Case series**

**USA**

**Study period:** 1995–2002

**n = 11 women (12 pregnancies)**

**Population:** Non-pregnant women with indications for transabdominal cerclage placement (based on obstetric history [see indications below], previous transvaginal cerclage attempts and current cervical anatomical status).

**Indications:** In seven women, the primary indication was the absence or virtual absence of the entire exocervix, precluding placement of a transvaginal cerclage. In one woman, the entire anterior cervix was absent; in two women, the cervix was markedly abnormal in appearance and three prior vaginal cerclage procedures had resulted in unacceptable outcomes; in one woman, there was a history of cone biopsy followed by a pregnancy loss at 20 weeks, and the markedly abnormal cervix was judged not suitable for transvaginal cerclage placement. In five women, there was no history of either a mid-trimester loss or a premature delivery (all had cervical anatomy that precluded transvaginal cerclage placement).

**Technique:** Mersilene polyester tape used (Ethicon Inc., Somerville, NJ, USA); no infusion of carbon dioxide is described; disposable laparoscopic suturing device used to pierce the broad ligament medial to the uterine vessels.

**Follow-up:** not stated

**Conflict of interest:** none stated

### Key Efficacy Findings

- Mean operating time = 68 minutes
- Mean estimated blood loss = <40 ml (range 10–100)
- 91% (10/11) of patients achieved a total of 12 pregnancies following cerclage placement. The only patient who did not achieve a pregnancy made no attempt to conceive within 1 year of surgery.
- 17% (2/12) of pregnancies resulted in losses at 8 weeks' gestation, including one in which a suction dilatation and curettage was performed for a missed abortion.
- 17% (2/12) of pregnancies resulted in deliveries by caesarean section at 34.5 weeks, one due to abnormal fetal heart rate and one due to severe pre-eclampsia. Both infants were born healthy.
- 67% (8/12) of pregnancies resulted in deliveries by caesarean section at 38 weeks or more, and all the infants were born healthy.
- Live birth rate = 83% (10/12)

None of the cerclages have been removed.

### Key Safety Findings

- In one woman, the procedure was complicated by an initially unrecognised penetrating small bowel injury that occurred during lysis of extensive adhesions involving the bowel and uterus. Subsequently, the patient developed a pelvic abscess that was treated with CT-guided drainage and intravenous antibiotics.
- 'There were no other surgical complications.'

### Comments

Retrospective review.

Study included five women with no history of either a mid-trimester loss or a premature delivery.

The authors stated that they are reluctant to place the cerclage in a pregnant woman because of concern about haemorrhage-related complications.

The authors believe that the firm nature of the non-pregnant cervical isthmus facilitates the ability of the surgeon to avoid injuring the uterine vessels.
Abbreviations used: CT, computed tomography

<table>
<thead>
<tr>
<th>Study details</th>
<th>Key efficacy findings</th>
<th>Key safety findings</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gallot D (2003)</td>
<td><strong>Operating times (minutes): 80, 110, 25</strong>&lt;br&gt;<strong>Estimated blood loss (ml): &lt; 100, 300, &lt; 100</strong>&lt;br&gt;Two of the women became pregnant within 4 months and delivered healthy babies by caesarean at 38 weeks’ gestation (one woman had two episodes of vaginal bleeding during the first trimester and was on bed rest between 33 and 38 weeks of gestation because of uterine contractions).&lt;br&gt;The third woman had not yet conceived at the time the paper was written.</td>
<td>In one woman, a uterine vessel was injured resulting in blood loss of 300 ml (transfusion was not required).</td>
<td>This study clearly documents recurrent loss of pregnancies in patient population.&lt;br&gt;The authors note that failure of a transvaginal cerclage per se is not necessarily an indication for the abdominal approach. They state that the indications have to be limited to very short or scarred cervices.</td>
</tr>
<tr>
<td>Case series</td>
<td><strong>France</strong>&lt;br&gt;<strong>Study period: not stated</strong>&lt;br&gt;<strong>n = 3</strong>&lt;br&gt;<strong>Population: Non-pregnant women with a history of recurrent miscarriages and failed vaginal cerclage.</strong>&lt;br&gt;Ages: 26, 29, 35 years&lt;br&gt;<strong>Indications:</strong> One woman had one first trimester pregnancy loss (requiring curettage) followed by two mid-trimester pregnancy losses despite a vaginal cerclage for the last pregnancy; one woman had five first trimester pregnancy losses followed by two mid-trimester losses despite two vaginal cerclages; one woman had three mid-trimester pregnancy losses despite one vaginal cerclage. In all cases, cervical incompetence was confirmed by hysterography.&lt;br&gt;<strong>Technique:</strong> Polyether suture used; gasless laparoscopy; a laparoscopic dissector was used to create a window through the broad ligament medial to the uterine vessels at the level of the internal os, through which the suture was placed.&lt;br&gt;<strong>Follow-up: not stated</strong>&lt;br&gt;<strong>Conflict of interest: none stated</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Study details

**Al-Fadhli R (2004)**

**Case series**

Canada

Study period: not stated

**n = 2**

Population: Non-pregnant women with previous failed cervical cerclages

Ages: 36, 38 years

Indications: Previous failed cerclage (previous history of loss of pregnancy not stated); no other inclusion or exclusion criteria stated.

Technique: Mersilene polyester tape used (Ethicon Inc., Somerville, NJ, USA); no infusion of carbon dioxide is described; disposable laparoscopic suturing device used to pierce the broad ligament medial to the uterine vessels.

**Follow-up: not stated**

Conflict of interest: none stated

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### Key efficacy findings

One woman achieved a term pregnancy. The second woman had not yet achieved pregnancy 2 months after laparoscopic cerclage.

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### Key safety findings

No complications were described in the paper.

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### Comments

The main aim of the paper is to describe the technique and few details are given about the two patients treated by the authors. The authors state that performing the procedure in the non-pregnant state has some advantages (including decreased fetal or maternal risk, easy manipulation and exposure, and minimal bleeding).
<table>
<thead>
<tr>
<th>Study details</th>
<th>Key efficacy findings</th>
<th>Key safety findings</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesser KB (1998)**</td>
<td>Operating time = 140 minutes A healthy baby girl was delivered by repeat caesarean at 35 weeks gestation after onset of regular contractions and the stitch was removed. (Mother had gestational diabetes, which was controlled by diet).</td>
<td>‘The procedure was complicated by a small amount of venous bleeding from beneath the right uterine artery, which was controlled by clips and packing’.</td>
<td>The paper also discusses a case of laparoscopic removal of transabdominal cerclage placed via laparotomy.</td>
</tr>
<tr>
<td><strong>Case report</strong></td>
<td><strong>USA</strong> Study period: not stated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n = 1</td>
<td>Population: Pregnant woman (gravida 3, para 1) with history of cervical incompetence (one previous loss of pregnancy at 19 weeks’ gestation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age = 40 years 11 weeks’ gestation at cerclage placement</td>
<td>Indications: History of cervical incompetence and insufficient cervical tissue for placement of transvaginal cerclage.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Follow-up: not stated</strong> Conflict of interest: not stated</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Abbreviations used: CT, computed tomography

<table>
<thead>
<tr>
<th>Study details</th>
<th>Key efficacy findings</th>
<th>Key safety findings</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Darwish AM (2002)</td>
<td>Operating time = 90 minutes</td>
<td>No complications were described.</td>
<td>The patient was offered laparoscopic cerclage because she refused abdominal cerclage.</td>
</tr>
<tr>
<td><strong>Case report</strong></td>
<td>Intraoperative blood loss = 'insignificant'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egypt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study period: not stated</td>
<td>Patient had an unremarkable pregnancy course and delivered a healthy baby at 37 weeks by repeat caesarean. The stitch was left in place.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n = 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population: Pregnant woman (gravid 11, para 5) with history of eight transvaginal cervical cerclage placements (four successful). Details of previous pregnancy losses not given.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age = 31 years</td>
<td>Follow-up: not stated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 weeks’ gestation at cerclage placement</td>
<td>Conflict of interest: none stated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indications: Vaginally, there was almost no cervix with a previous history of annular detachment of the cervix. Abdominal cerclage was indicated but the patient refused laparotomy.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technique: Mersilene tape was used (Ethicon, Norderstedt, Germany); it is not clear from the paper whether insufflation with carbon dioxide was used. The procedure did not involve creating a window in the broad ligaments, as the bladder dissection was extended laterally to provide access for the needle to be safely passed to the posterior aspect of the uterus.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

IP Overview: laparoscopic cervical cerclage
**Study details** | **Key efficacy findings** | **Key safety findings** | **Comments**
--- | --- | --- | ---
Brölmann HAM (2002)

**Case report**

The Netherlands

Study period: not stated

n = 1

Population: non-pregnant woman with absent cervix following treatment of cervical intraepithelial neoplasia and previous loss of pregnancy at 17 weeks gestation.

Age = 32 years

Indications: Woman had previous history of large loop excision of the cervix, followed by delivery of immature fetus at 17 weeks' gestation. No vaginal part of the cervix could be detected.

Technique: Mersilene band was used (Ethicon, Norderstedt, Germany); uterine mobiliser was used; band was loosely tied posteriorly just above the level of the sacrouterine ligaments, so that an 8 mm dilator could pass easily through the cervical canal.

**Follow-up: not stated**

Conflict of interest: none stated

Operating time = 40 minutes

The patient conceived some months later and had an uneventful pregnancy. A caesarean section was performed at 37 weeks because of suspected impairment of fetal growth, a high flow resistance in the placental bed and changes on cardiocartography. A live baby was delivered (low birthweight for gestational age).

The band was removed during the caesarean section as the patient did not desire any future pregnancies.

No complications were described.

The authors suggest that the low birthweight for gestational age may have been due to the fact that the patient was a heavy smoker.
<table>
<thead>
<tr>
<th>Study details</th>
<th>Key efficacy findings</th>
<th>Key safety findings</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kjøllesdal M (2005)**</td>
<td>Patient became pregnant shortly after laparoscopic cerclage was performed and was able to maintain a normal level of activity during the pregnancy. Elective caesarean was done at 37 weeks gestation. (The paper does not give any details of the infant).</td>
<td>No complications were described.</td>
<td>The authors stated that they used mesh instead of polyester tape, as tape has been shown to cause erosion of the lower uterine segment when used for cerclage. The authors stated that the procedure should be performed as an elective operation when the patient is not pregnant.</td>
</tr>
</tbody>
</table>

**Case report**

Norway

Study period: not stated

n = 1

Population: Non-pregnant woman (gravida 9, para 1) with history of eight second trimester miscarriages.

Age = 33 years

Indications: Patient had experienced eight miscarriages, all during 20–24 weeks’ gestation. During one pregnancy she had been treated with a vaginal cerclage. During her eighth pregnancy, she developed cervical incompetence at 24 weeks gestation and spent the rest of the pregnancy immobilised; she had a normal delivery at 37 weeks. The cervix was noted to be extremely short.

Technique: Polypropylene mesh rather than tape used; mesh was placed loosely around the isthmus uteri, through a window in the broad ligament, and fixed with a suture anteriorly.

Follow-up: not stated.

Conflict of interest: none stated
Validity and generalisability of the studies

- The studies are all small case series or single case reports.
- Three studies included only pregnant women and the remaining five studies performed laparoscopic cervical cerclage as an interval procedure in non-pregnant women.
- One study compares post-procedural obstetric outcomes with pre-procedural ones. This comparison is difficult to interpret outside the context of a controlled trial, as “regression to the mean” phenomenon may be partly responsible.¹
- One study stated that five women who did not have a history of mid-trimester loss or premature delivery were included in the study (all had cervical anatomy that precluded transvaginal cervical cerclage placement).² It is possible that these patients would not have suffered loss of pregnancy, even without any cerclage.
- Various techniques were used; one study used polypropylene mesh rather than polyester tape.⁸

Specialist Advisers’ opinions

Specialist advice was sought from consultants who have been nominated or ratified by their Specialist Society or Royal College.

Dr A Cameron, Mr R Farquharson, Professor L Regan, Professor A Shennan

- The procedure is definitely novel and of uncertain safety and efficacy.
- An appropriate comparator would be transabdominal cerclage inserted via laparotomy.
- Investigations prior to transabdominal cerclage and inclusion criteria vary from centre to centre.
- The technique varies between centres.
- The procedure should only be carried out by experienced laparoscopic surgeons.
- There is uncertainty about the efficacy of transabdominal cerclage.
- There is uncertainty about how safe and effective pre-conceptual transabdominal cerclage is compared with first trimester insertion.
- One Specialist Adviser stated that there is serious bias reporting of the success of abdominal cerclage.
- Outcome measures of benefit include live birth rate, the number of successful pregnancies for individual patients after laparoscopic transabdominal cerclage, and successful prolongation of pregnancy. Other outcome measures include recurrence of mid-trimester loss and number of returns to theatre.
- Adverse outcomes include the need for hysterotomy or laparotomy, the need for hysterectomy, infection, haemorrhage, intrauterine death, fetal growth restriction and preterm delivery.
- The potential impact on the NHS, in terms of numbers of patients and use of resources, is minor to moderate.
Issues for consideration by IPAC

- The title currently states that this procedure is for prevention of recurrent second trimester miscarriage. Recurrent miscarriage is defined as the loss of three or more pregnancies but some of the evidence in this overview does not conform to this definition. The indications are currently described as ‘cervical incompetence not amenable to a conventional transvaginal procedure, or following previous failed elective vaginal cerclage’.
References


Appendix A: Additional papers on laparoscopic cerclage for prevention of recurrent pregnancy loss due to cervical incompetence not included in summary table 2

The following table outlines the studies that are considered potentially relevant to the overview but were not included in the main data extraction table (table 2). It is by no means an exhaustive list of potentially relevant studies.

<table>
<thead>
<tr>
<th>Article title</th>
<th>Number of patients/ follow-up</th>
<th>Direction of conclusions</th>
<th>Reasons for non-inclusion in table 2</th>
</tr>
</thead>
</table>
Appendix B: Related published NICE guidance for laparoscopic cerclage for prevention of recurrent pregnancy loss due to cervical incompetence

<table>
<thead>
<tr>
<th>Guidance programme</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interventional procedures</td>
<td>None applicable</td>
</tr>
<tr>
<td>Technology appraisals</td>
<td>None applicable</td>
</tr>
<tr>
<td>Clinical guidelines</td>
<td>None applicable</td>
</tr>
<tr>
<td>Public health</td>
<td>None applicable</td>
</tr>
</tbody>
</table>
Appendix C: Literature search for laparoscopic cerclage for prevention of recurrent pregnancy loss due to cervical incompetence

<table>
<thead>
<tr>
<th>Database</th>
<th>Date searched</th>
<th>Version searched</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cochrane Library</td>
<td>05/01/07</td>
<td>2006, Issue 4</td>
</tr>
<tr>
<td>CRD databases (DARE &amp; HTA)</td>
<td>05/01/07</td>
<td>2006, Issue 4</td>
</tr>
<tr>
<td>Embase</td>
<td>05/01/07</td>
<td>1980 to 2007 Week 01</td>
</tr>
<tr>
<td>Medline</td>
<td>05/01/07</td>
<td>1966 to November Week 3 2006</td>
</tr>
<tr>
<td>Premedline</td>
<td>05/01/07</td>
<td>January 04, 2007</td>
</tr>
<tr>
<td>CINAHL</td>
<td>05/01/07</td>
<td>1982 to December Week 2 2006</td>
</tr>
<tr>
<td>British Library Inside Conferences</td>
<td>05/01/07</td>
<td>-</td>
</tr>
<tr>
<td>NRR</td>
<td>05/01/07</td>
<td>2006, Issue 4</td>
</tr>
<tr>
<td>Controlled Trials Registry</td>
<td>05/01/07</td>
<td></td>
</tr>
</tbody>
</table>

The following search strategy was used to identify papers in Medline. A similar strategy was used to identify papers in other databases.

1  exp Laparoscopy/ (  
2  exp Laparoscopes/  
3  exp Surgical Procedures, Minimally Invasive/ (  
4  Laparoscop$.tw.  
5  endoscop$.tw.  
6  percutan$.tw.  
7  or/1-6  
8  Cerclage, Cervical/  
9  Uterine Cervical Incompetence/  
10  ((transabdomin$ or cervico isthmic$ or isthm$ or McDonald$ or shirodka$ or abdomin$ or surgica$) adj3 cerclage$).tw.  
11  (cervic$ adj3 (suture$ or stitch$ or cerclage$ or incompetenc$)).tw.  
12  Sutures/  
13  or/8-12  
14  exp Pregnancy Trimester, Second/  
15  Obstetric Labor, Premature/  
16  Premature Birth/  
17  Abortion, Spontaneous/  
18  Miscarriag$.tw.  
19  ((Prematur$ or preterm$) adj3 (birth$ or delivery$)).tw.  
20  (pregnan$ adj3 loss$).tw.  
21  or/14-20  
22  7 and 13 and 21  
23  Animals/  
24  Humans/  
25  23 not (23 and 24)  
26  22 not 25  
27  from 26 keep 1-16