

# BMJ Case Reports

## Endoscopic transabdominal cervical cerclage replacement after recurrent late miscarriage.

Journal:	<i>BMJ Case Reports</i>
Manuscript ID	Draft
Manuscript Type:	Case report
Date Submitted by the Author:	n/a
Complete List of Authors:	Hirsch, Martin; Oxford University, Oxford Endometriosis CaRe Centre Reisel, Dan; University College London; University College London Hospitals NHS Foundation Trust, Reproductive Medicine Unit Saridogan, Ertan; University College London, Elizabeth Garrett Anderson Institute for Women's Health; University College London NHS Foundation Trust, Reproductive Medicine Unit David , Anna ; University College London, EGA Institute for Women's Health; NIHR University College London Hospitals Biomedical Research Centre,
Keywords:	Pregnancy < Obstetrics and gynaecology, Materno-fetal medicine < Paediatrics

SCHOLARONE™  
Manuscripts

## TITLE OF CASE

---

### **Endoscopic transabdominal cervical cerclage replacement after recurrent late miscarriage.**

## SUMMARY

---

Transabdominal cerclage (TAC) is a recognised treatment for recurrent spontaneous late miscarriage or preterm birth due to cervical weakness. This can be performed via an open procedure before and during pregnancy, or a laparoscopic technique preconception. Complications include cerclage failure and suture migration. We present a case highlighting these complications where laparoscopic removal of an open TAC and replacement led to two successful term deliveries. A 30-year-old African woman with a fibroid uterus, adenomyosis and a history of three spontaneous mid-trimester losses, had an open TAC at 13 weeks of gestation. Preterm premature rupture of the membranes (PPROM) occurred shortly after and at 18 weeks of gestation she underwent surgical evacuation of the uterus. Subsequent hysteroscopy confirmed migration of the cerclage through the cervical canal. We demonstrate the application of endoscopic gynaecological surgery to remove and replace the TAC with two successful term births by Caesarean section in the ensuing pregnancies.

## BACKGROUND

---

Vaginal cerclage is commonly used to reduce preterm birth and prevent fetal loss, often in the context of recurrent miscarriage.[1] Although randomised controlled trials are still largely lacking, cerclage is thought to reduce the risk of perinatal death when compared with no cerclage, and may benefit the small number of women with traumatic cervical damage or genuine cervical weakness.[2, 3] In women with spontaneous late miscarriage or preterm birth following a full dilatation Caesarean section, vaginal cervical cerclage may be less effective, requiring a different approach.[4]

In women for whom vaginal cerclage fails, transabdominal cerclage (TAC) has been advocated. This requires more extensive surgery than vaginal cerclage, and delivery is usually via caesarean section. Amongst those women with recurrent miscarriage and extreme prematurity, neonatal survival increases from 3-36% prior to TAC to up to 73-100% in a review of published case series.[5, 6] This is supported by a recent randomised controlled trial that demonstrated reduced rates of preterm birth and fewer fetal losses associated with transabdominal cerclage compared with vaginal cerclage performed either via the Macdonald (low vaginal) or Shirodkar (high vaginal) technique.[7]

Open TAC was first described in 1965 whereby a Pfannenstiel incision was used to enter the abdominal cavity prior to opening the uterovesical fold with caudal displacement of bladder and siting of the cerclage at the cervico-isthmic junction. This procedure can be performed up to 14/15 week's gestation but evidence from a large case series suggests that it is more efficacious if performed preconception.[8] The first laparoscopic TAC was performed in 1998 but was complicated by an injury to the uterine artery requiring clipping.[9] Guidance from NICE on the procedure was published in 2007 and updated in 2019.[10, 11] The surgical technique for laparoscopic TAC is important as the Mersilene® (Ethicon, LCC, USA) suture needs to be accurately placed at the cervico-isthmic junction immediately medial to the uterine vessels.[12] Therefore, it can be a challenging operation, especially when the uterus has additional pathology such as fibroids, adenomyosis or previous surgery, including suture placement.

Laparoscopic procedures are most commonly performed prior to pregnancy with the benefit of pre-pregnancy insertion, particularly for laparoscopic procedures, being the ability to use a uterine

manipulator to facilitate acute ante and retroversion of the uterus during suture insertion. The risks of bleeding, infection and thromboembolism are lower prior to pregnancy but there is the potential for subsequent infertility, albeit small. First trimester miscarriage is often managed via surgery, with cautious cervical dilatation and uterine evacuation. While a relatively safe procedure, complications of TAC have been identified following both open and laparoscopic procedures but remain poorly reported in published case series. These complications include suture migration, rectouterine fistula some years later, uterine rupture, and fetal growth restriction.[5, 13] Laparoscopic TAC removal after pregnancy failure has been reported but without concurrent reinsertion or subsequent pregnancy.[14-16]

We report a case of endoscopic removal of a migrated open TAC suture with replacement and subsequent two term births.

---

## CASE PRESENTATION

---

A 30-year-old African woman with raised BMI (31), a fibroid uterus and adenomyosis presented with a history of recurrent spontaneous late miscarriages at 15 and 23+5 weeks of gestation; in her third ongoing pregnancy her cervix funnelled through an elective low vaginal cerclage placed at 14 weeks and she delivered at 22+5 weeks of gestation. Laparoscopic pre-pregnancy TAC was recommended but she conceived rapidly and therefore underwent an open TAC with Mersilene® tape placed at 13 weeks of gestation, and a posterior tied knot. Although the surgery was uneventful three days later she ruptured her membranes. With ongoing anhydramios and the development of infection she proceeded to termination of pregnancy at 18 weeks of gestation. An uncomplicated cervical dilatation and evacuation (D&E) was performed under ultrasound guidance to preserve the integrity of the TAC.

---

## INVESTIGATIONS *If relevant*

---

An ultrasound 6 weeks following this pregnancy showed an intact TAC but subsequent outpatient hysteroscopy at 3 months confirmed part of the TAC suture had migrated through into the cervical canal. The patient underwent extensive counselling about endoscopic removal and reinsertion under general anaesthetic and agreed to proceed.

---

## DIFFERENTIAL DIAGNOSIS *If relevant*

---

N/A

---

## TREATMENT *If relevant*

---

Under general anaesthesia a combined hysteroscopic and laparoscopic procedure was performed. Using an operative hysteroscope (AlphaScope®, Gimmi, DE) with cold scissors the suture was visualised in the cervical canal and released (Video 1; time 00:32). During laparoscopy the patient had healthy adnexa with no evidence of pelvic endometriosis. The uterovesical fold was thickened in keeping with previous cerclage insertion. Sharp dissection with the Thunderbeat® (Olympus Corp, Japan) advanced bipolar device enabled dissection of the uterovesical fold with haemostasis while the suture was identified and removed (Video 1; time 2:25). The uncomplicated reinsertion of a modified Mersilene® tape TAC medial to uterine vessels and immediately lateral to cervico-isthmic junction was performed with an anterior

cervical knot. Care was taken to lay the tape flat on the uterus and to cut the ends to 1–2 cm (Video 1; time 3:18). This technique uses a modified curved to straight blunt needle with Mersilene® (Ethicon US, LCC, USA) tape.

## OUTCOME AND FOLLOW-UP

---

The patient conceived spontaneously with a low risk combined test Down's syndrome screen. She began low dose aspirin 150mg at night and vaginal Cyclogest 200mg pessary at night due to her history of recurrent perinatal loss. She underwent serial cervical length ultrasound examination from 12 weeks of gestation which confirmed a long cervix (36mm) with the TAC remaining at the level of the cervical isthmus (Figure 1). She developed two asymptomatic urinary tract infections in the second trimester which were treated with oral antibiotics. She was diagnosed with gestational diabetes at 18 weeks of gestation and was prescribed metformin 500mg at night at 22 weeks which continued until the end of pregnancy. Fetal growth velocity was suboptimal with the estimated fetal weight <5th centile on customised fetal charts. At 37+1 weeks she received two doses of betamethasone steroids to mature the fetal lungs and an elective Caesarean section was performed two days later. The cerclage was seen at the level of the internal cervical os, and the uterine incision was placed 2cm above. The delivery was straight forward and the estimated blood loss was 400ml. A live male infant was born weighing 2050g with good Apgar score at 1 and 5 minutes. Postoperative recovery was complicated by fever and endometritis on day 2 postnatal which resolved with intravenous antibiotics. She spontaneously conceived again two years later, and had an uneventful pregnancy, but again complicated by gestational diabetes which was managed with metformin treatment. Delivery was an elective Caesarean section at 37+4 weeks with a live male infant born weighing 2620g with good Apgar scores. Postnatal recovery was uncomplicated.

## DISCUSSION *Include a very brief review of similar published cases*

---

Transabdominal cerclage is a complex procedure with associated immediate and delayed complications. Suture migration is rare, and a solitary case report highlights its occurrence even in the absence of dilatation and evacuation.[15] When dilatation and curettage or evacuation is required caution must be taken although the complication rate is low. The largest case series spanning 20 years at a single centre, followed 142 women with a TAC in situ.[17] Amongst this cohort, 19 uterine evacuations of pregnancy loss occurred with a solitary minor complication, bleeding (300ml), requiring uterine compression. Successful pregnancy following these procedures was common. Similar outcomes were reported in a case notes review of 19 women at high risk for second trimester loss and early preterm delivery, who were treated with a preconception TAC.[18] There is one case report of D&E performed at 18 weeks through a TAC with a successful ensuing pregnancy.[19]

Historic pathways led many women to being treated with transvaginal cervical cerclage irrespective of the cause. The NHS England Saving Babies Lives Care Bundle Version Two recommends that women with a previous failed transvaginal cerclage should have their care managed by an experienced clinical team able to offer the most appropriate management options.[20] The multidisciplinary team approach of minimally invasive gynaecologists and pre-term birth specialists at University College London Hospitals has resulted in an established pathway for the management of women requiring an elective pre-

pregnancy laparoscopic TAC.[6] Similar teams have developed under the umbrella of the UK Preterm Clinical Network as recommended in Saving Babies Lives Care Bundle.[21]

This case report adds to the limited existing evidence demonstrating the feasibility of laparoscopic removal of TAC following pregnancy loss, failure, or complication. We report the first hysteroscopic freeing, laparoscopic TAC removal and simultaneous re-insertion with successful subsequent two deliveries of healthy infants at term gestation.

---

## LEARNING POINTS/TAKE HOME MESSAGES 3-5 bullet points

---

### THIS IS A REQUIRED FIELD

**TIP:** *This is the most crucial part of the case – what do you want readers to remember when seeing their own patients?*

- Transabdominal cerclage is a recognised treatment for recurrent spontaneous late miscarriage or preterm birth due to cervical weakness.
- This can be performed via an open procedure before and during pregnancy, or a laparoscopic technique preconception.
- Laparotomy can be avoided with laparoscopic removal of failed TAC with simultaneous re-insertion.

---

## REFERENCES

---

1. McManemy J, Cooke E, Amon E, Leet T. Recurrence risk for preterm delivery. *Am J Obstet Gynecol.* 2007 Jun;196(6):576.e1-6; discussion 576.e6-7.
2. Alfirevic Z, Stampalija T, Medley N. Cervical stitch (cerclage) for preventing preterm birth in singleton pregnancy. *Cochrane Database Syst Rev.* 2017 Jun 6;6(6):CD008991.
3. Owen J, Hankins G, Iams JD, Berghella V, Sheffield JS, Perez-Delboy A, et al. Multicenter randomized trial of cerclage for preterm birth prevention in high-risk women with shortened midtrimester cervical length. *Am J Obstet Gynecol.* 2009 Oct;201(4):375.
4. Watson HA, Carter J, David AL, Seed PT, Shennan AH. Full dilation cesarean section: a risk factor for recurrent second-trimester loss and preterm birth. *Acta Obstet Gynecol Scand.* 2017 Sep;96(9):1100-1105.
5. Gibb D, Saridogan, E. The Role of Transabdominal Cervical Cerclage Techniques in Maternity Care, *The Obstetrician & Gynaecologist.* 18.2 (2016): 117-25.
6. Saridogan E, O'Donovan OP, David AL. Preconception laparoscopic transabdominal cervical cerclage for the prevention of midtrimester pregnancy loss and preterm birth: a single centre experience. *Facts Views Vis Obgyn.* 2019 Mar;11(1):43-48.
7. Shennan A, Chandiramani M, Bennett P, David AL, Girling J, Ridout A, Seed PT, Simpson N, Thornton S, Tydeman G, Quenby S, Carter J. MAVRIC: a multicenter randomized controlled trial of transabdominal vs transvaginal cervical cerclage. *Am J Obstet Gynecol.* 2020 Mar;222(3):261.e1-261.e9.
8. Dawood F, Farquharson RG. Transabdominal cerclage: preconceptual versus first trimester insertion. *Eur J Obstet Gynecol Reprod Biol.* 2016 Apr;199:27-31.
9. Scibetta JJ, Sanko SR, Phipps WR. Laparoscopic transabdominal cervicoisthmic cerclage. *Fertil Steril.* 1998;69(1):161-163.
10. NICE guidance. Interventional procedures guidance [IPG228]: Laparoscopic cerclage for prevention of recurrent pregnancy loss due to cervical incompetence. 2007.

11. NICE. Laparoscopic cerclage for cervical incompetence to prevent late miscarriage or preterm birth. National Institute for Health and Care Excellence. 2019.
12. Suff N, Kuhrt K, Chandiramani M, Saridogan E, David A, Shennan AH. Development of a video to teach clinicians how to perform a transabdominal cerclage, 1 Nov 2020, In: American Journal of Obstetrics & Gynecology MFM. 2, 4, p. 100238
13. Hawkins E, Nimaroff M. Vaginal erosion of an abdominal cerclage 7 years after laparoscopic placement. *Obstet Gynecol*. 2014 Feb;123(2 Pt 2 Suppl 2):420-423.
14. Scarantino SE, Reilly JG, Moretti ML, Pillari VT. Laparoscopic removal of a transabdominal cervical cerclage. *Am J Obstet Gynecol*. 2000 May;182(5):1086-8.
15. Carter JF, Soper DE. Laparoscopic removal of abdominal cerclage. *JSL*. 2007 Jul-Sep;11(3):375-7.
16. Agdi M, Tulandi T. Placement and removal of abdominal cerclage by laparoscopy. *Reprod Biomed Online*. 2008 Feb;16(2):308-10.
17. Dethier D, Lassey SC, Pilliod R, Einarsson JI, McElrath T, Bartz D. Uterine evacuation in the setting of transabdominal cerclage. *Contraception*. 2020 Mar;101(3):174-177.
18. Groom KM, Jones BA, Edmonds DK, Bennett PR. Preconception transabdominal cervicoisthmic cerclage. *Am J Obstet Gynecol*. 2004 Jul;191(1):230-4.
19. Chandiramani M, Chappell L, Radford S, Shennan A. Successful pregnancy following mid-trimester evacuation through a transabdominal cervical cerclage. *BMJ Case Rep*. 2011 Jun 29;2011:bcr0220113841. doi: 10.1136/bcr.02.2011.3841.
20. NHS England. Saving Babies' Lives Version Two. 2019.
21. Story L, Simpson NAB, David AL, Alfirevic ZZ, Bennett PR, Jolly M, et al. Reducing the impact of preterm birth: Preterm birth commissioning in the United Kingdom. *Eur J Obstet Gynecol Reprod Biol*. 2019;3:1-5.

---

## FIGURE/VIDEO CAPTIONS

Figure 1: Laparoscopic TAC *in situ* – 16 weeks.

Video 1: Hysteroscopic freeing, laparoscopic TAC removal with simultaneous re-insertion.

---

## PATIENT'S PERSPECTIVE

**TIP:** This is an important section and gives the patient/next of kin the opportunity to comment on their experience. This enhances the case report and is strongly encouraged.

It was such a relief for me not to have to have another big cut on my tummy for the repeat TAC procedure. Recovery from the open TAC surgery took a few weeks. But the laparoscopic procedure was far less painful and I got over it really quickly in comparison.

---

## INTELLECTUAL PROPERTY RIGHTS ASSIGNMENT OR LICENCE STATEMENT

I, [Anna L. David], the Author has the right to grant and does grant on behalf of all authors, an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the relevant stated

licence terms for US Federal Government Employees acting in the course of their employment, on a worldwide basis to the BMJ Publishing Group Ltd (“BMJ”) and its licensees, to permit this Work (as defined in the below licence), if accepted, to be published in BMJ Case Reports and any other BMJ products and to exploit all rights, as set out in our licence [author licence](#).

**Date:** 3 November 2021

**PLEASE SAVE YOUR TEMPLATE WITH THE FOLLOWING FORMAT:**

Submitting author’s last name and date of submission, e.g. Smith\_November\_2018.doc

**EXAMPLE OF A WELL PRESENTED CASE REPORT**

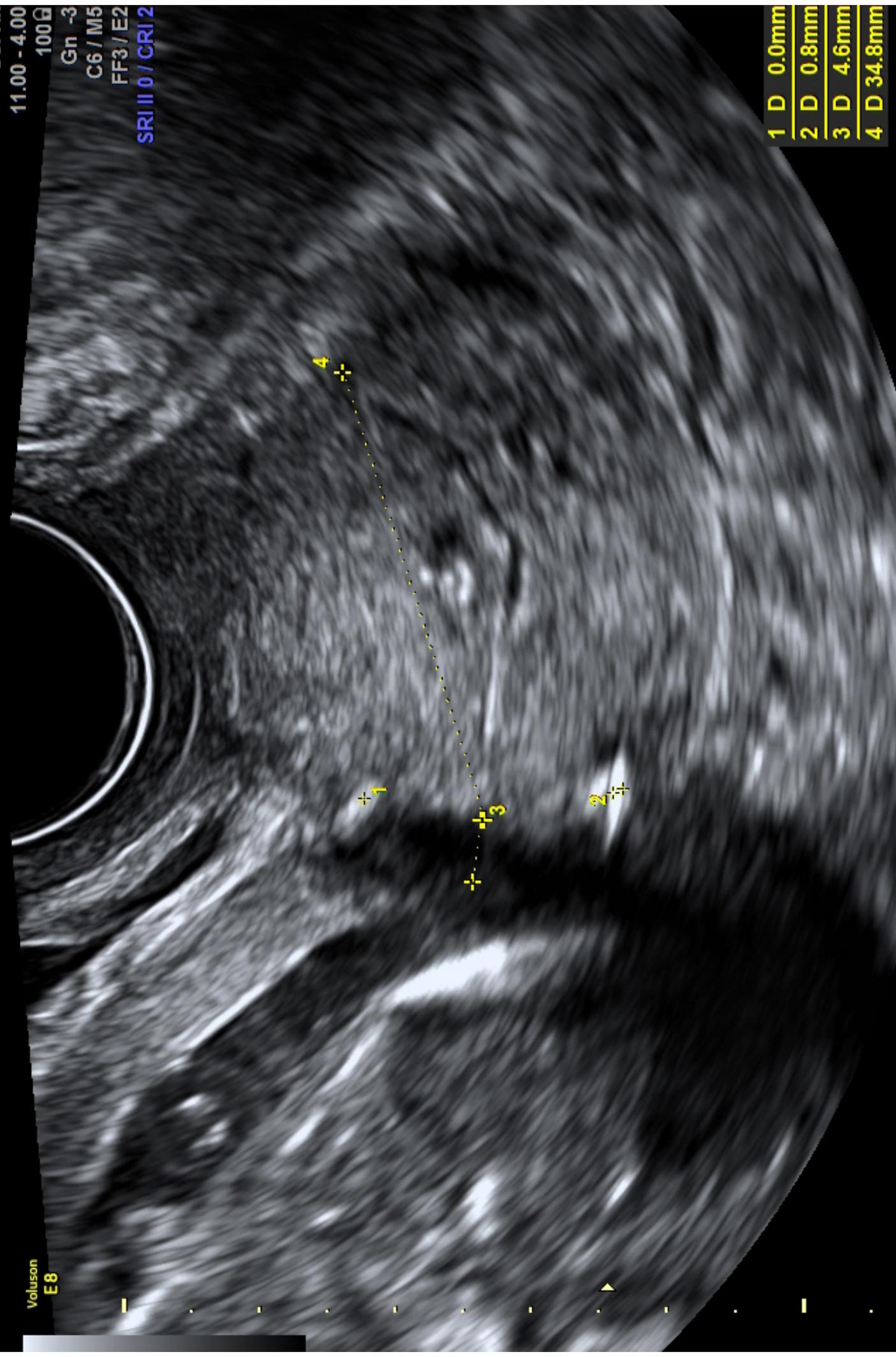
Resection of a large carotid paraganglioma in Carney-Stratakis syndrome: a multidisciplinary feat

RIC5-9-D/OB  
6.0cm / 1.5 / 34Hz

MI 0.8  
Tlb 0.7

EGA Ultrasound Screening  
10.07.2019 09:46:02AM

Cervix  
11.00 - 4.00  
100g  
Gn -3  
C6 / M5  
FF3 / E2  
SRI II 0 / CRI 2



- 1 D 0.0mm
- 2 D 0.8mm
- 3 D 4.6mm
- 4 D 34.8mm

Voluson  
E8