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North East and North Cumbria
Local Maternity System

Guideline for screening, diagnosis and management of women at risk of placenta accreta spectrum

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1. Introduction

- Placenta accreta spectrum (PAS), also known as abnormally invasive placenta (AIP), is a rare complication of pregnancy affecting 1 in 2000-3000 maternities although the incidence is increasing as a consequence of the rising caesarean section (CS) rate.[1] This guideline compliments RCOG guidance[2] but focuses on regional screening, diagnosis and management of PAS. In 2019, The Newcastle upon Tyne Hospitals NHS Foundation Trust (NuTH) was recognised by NHSE as the specialised centre for PAS in the North East & North Cumbria (NENC).

- Pathologically PAS is divided into placenta accreta (where extravillous trophoblast [EVT] directly attaches to myometrium), increta (where EVT invades into myometrium) and percreta (where EVT invades to the serosa and/or adjacent structures). Between 60-70% of cases are accreta. FIGO have reported a grading system for the clinical diagnosis of PAS (Appendix 1).[3]

- Abnormal invasion causes incomplete separation of the placenta after delivery predisposing women to massive obstetric haemorrhage (MOH) with associated morbidities. PAS is one of the most important and potentially avoidable causes of maternal death. Risks increased with the extent of invasion; overall case fatality rate with PAS is reported to be 0.05% but is much higher with placenta percreta (up to 2-3%).[1]

- Risk factors for PAS are prior uterine surgery (with breach of the endometrium) and placental implantation over the surgical scar. Thus, the commonest risk factors are prior CS and anterior low-lying placenta or placenta praevia.[2] Risk of PAS increases with the number of prior CS;[4]

Number of CS	Incidence AIP	Rate AIP if placenta praevia	Rate AIP if no placenta praevia	Rate of hysterectomy
One	0.24%	3.3%	0.03%	0.65%
Two	0.31%	11%	0.2%	0.42%
Three	.057%	40%	0.1%	0.9%
Four	2.13%	61%	0.8%	2.4%
Five	2.33%	67%	0.8%	3.49%
Six or more	6.74%	67%	4.7%	8.99%

Expert consensus recommends that women with a history of one or more CSs, myomectomy or prior PAS should be regarded as high risk.[5]

- Previously in the UK only 50% of cases with PAS were diagnosed prior to delivery.[6] The introduction of the regional PAS screening program in 2018 has reduced this to <5% in NENC. Overall pooled estimates for the rate of peripartum hysterectomy for PAS are 52%. In contrast, the hysterectomy rate for PAS at Newcastle over the last 4 years is less than 35%.

2. Ultrasound features of PAS

- PAS is associated with characteristic features on ultrasound.[5] The predictive characteristics of each feature have been reported.[6] There are four key features (Figure 1);

(a) Placental lacunae

(b) Loss of retroplacental 'clear zone' (or hypoechoic space)

(c) Abnormalities of uterus-bladder interface

(d) Colour Doppler abnormalities (including uterovesical hypervascularity and bridging vessels)

The more features present, the more likely there is PAS and the more likely there is a major invasion (increta or percreta). Published and local data confirm that absence of any ultrasound feature (provided the ultrasound is performed by an experienced sonographer) excludes major invasion in more than 98% of PAS cases.[7]

- Using these four features, effective screening is possible at 22-24 weeks' gestation. However, local experience also shows that many women referred for PAS screening after their routine anomaly scan at 18-21 weeks do not have a low-lying placenta (i.e. the placental edge is **more than 20 mm from the cervical os**). Thus, screening for PAS is better performed at 26-28 weeks of pregnancy.

- More recent experience from specialised centres suggests similar ultrasound features can be used to diagnose PA at 13-16 weeks, allowing women different reproductive choices.[8] Very high risk women (i.e. those with prior PAS or more than 2 prior CSs) should therefore be referred directly to NuTH for prenatal diagnosis if their 11-14 wk scan shows an anterior low placenta.

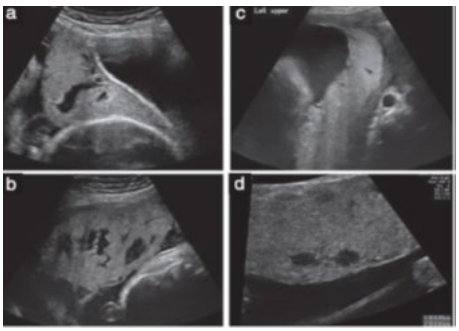
- Definitive prenatal diagnosis of the presence and type of PAS (required to plan surgical management) requires specialised ultrasound and placental MRI (pMRI) which are only available at NuTH. Women suspected of PAS should be referred to NuTH no later than 30 weeks' gestation.

- The screening/diagnosis pathway is summarised in the Figure 2.

- For information the management pathway for confirmed cases of PAS is shown in Appendix 2.

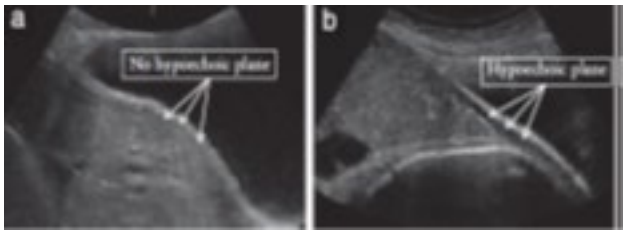
Figure 1: Ultrasound features of abnormally invasive placenta[4]

1. **Lacunae** (large [>1 cm] irregular echoluscent areas usually with visible turbulent flow – the more/larger the lacunae the more likely there is PAS and the more likely this is placenta increta/percreta (sensitivity 78%, specificity 95%).



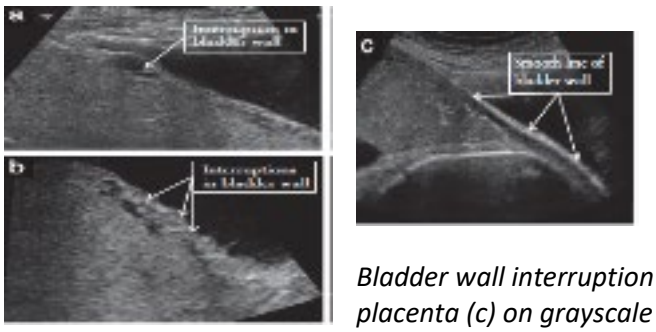
Abnormal placental lacunae (a,b) and normal placenta (c,d) on grayscale ultrasound

2. **Loss of retoplacental hypoechoic space** (loss of decidua and subplacental vascular space (sensitivity 66%, specificity 96%)



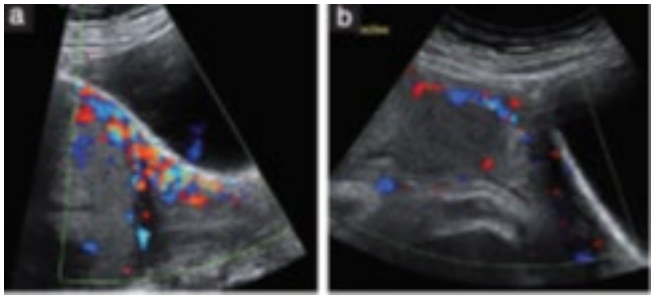
Loss of clear zone (a) and normal placenta (b) on grayscale ultrasound

3. **Abnormalities of uterus-bladder interface** – bulge or focal exophytic mass (typically extending beyond serosa and seen inside filled bladder (sensitivity 50%, specificity 99.8%)



Bladder wall interruption / exophytic mass (a,b) and normal placenta (c) on grayscale ultrasound

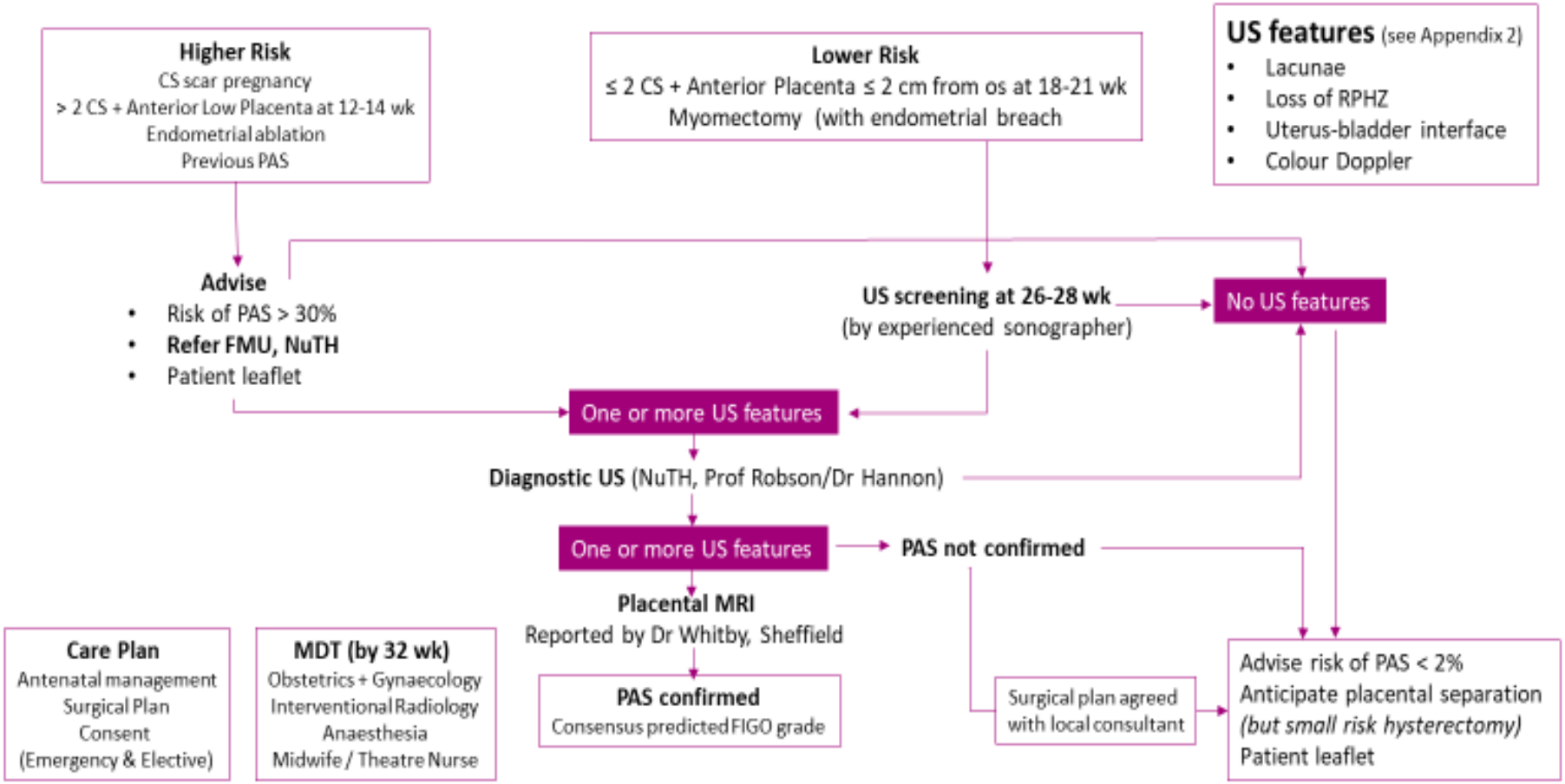
4. Colour Doppler abnormalities – subplacental and/or uterovesical hypervascularity (sensitivity 91%, specificity 88%)



Uterovesical hypervascularity (a) and a normal vascularity (b) on colour Doppler imaging

Women at risk of PAS

(Previous CS, prior PAS, prior myomectomy or endometrial ablation



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PAS Guideline v1

15.1.2023

Appendix 1: FIGO classification for the clinical diagnosis of PAS

Grade 1: Abnormally adherent placenta (placenta adherenta or creta)

Clinical criteria

- At vaginal delivery
  - No separation with synthetic oxytocin and gentle controlled cord traction
  - Attempts at manual removal of the placenta results in heavy bleeding from the placenta implantation site requiring mechanical or surgical procedures
- If laparotomy is required (including for cesarean delivery)
  - Same as above
  - Macroscopically, the uterus shows no obvious distension over the placental bed (placental "bulge"), no placental tissue is seen invading through the surface of the uterus, and there is no or minimal neovascularity

Histologic criteria

- Microscopic examination of the placental bed samples from hysterectomy specimen shows extended areas of absent decidua between villous tissue and myometrium with placental villi attached directly to the superficial myometrium
- The diagnosis cannot be made on just delivered placental tissue nor on random biopsies of the placental bed

Grade 2: Abnormally invasive placenta (Increta)

Clinical criteria

- At laparotomy
  - Abnormal macroscopic findings over the placental bed: bluish/purple colouring, distension (placental "bulge")
  - Significant amounts of hypervascularity (dense tangled bed of vessels or multiple vessels running parallel craniocaudially in the uterine serosa)
  - No placental tissue seen to be invading through the uterine serosa.
  - Gentle cord traction results in the uterus being pulled inwards without separation of the placenta (so-called the dimple

sign) Histologic criteria

- Hysterectomy specimen or partial myometrial resection of the increta area shows placental villi within the muscular fibers and sometimes in the lumen of the deep uterine vasculature (radial or arcuate arteries)

Grade 3: Abnormally invasive

placenta (Percreta) Grade 3a:

Limited to the uterine serosa

Clinical criteria

- At laparotomy
  - Abnormal macroscopic findings on uterine serosal surface (as above) and placental tissue seen to be invading through the surface of the uterus
  - No invasion into any other organ, including the posterior wall of the bladder (a clear surgical plane can be identified between the bladder and uterus)
- Histologic criteria
  - Hysterectomy specimen showing villous tissue within or breaching the uterine

serosa Grade 3b: With urinary bladder invasion

Clinical criteria

- At laparotomy
  - Placental villi are seen to be invading into the bladder but no other organs
  - Clear surgical plane cannot be identified between the

bladder and uterus Histologic criteria

- Hysterectomy specimen showing villous tissue breaching the uterine serosa and invading the bladder wall tissue or

urothelium Grade 3c: With invasion of other pelvic tissue/organs

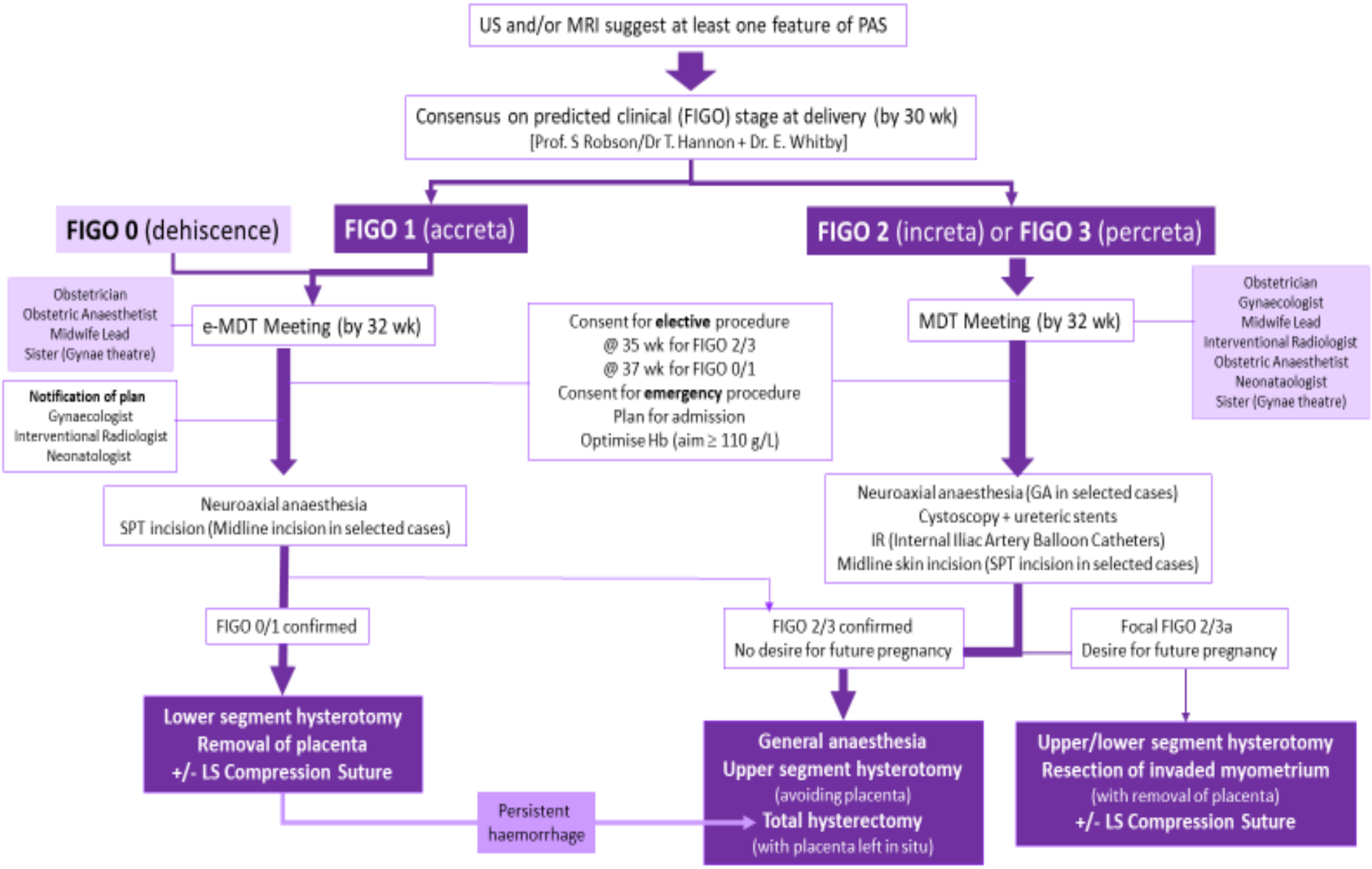
Clinical criteria

- At laparotomy
  - Placental villi are seen to be invading into the broad ligament, vaginal wall, pelvic sidewall or any other pelvic organ (with or without invasion of the bladder)

Histologic criteria

- Hysterectomy specimen showing villous tissue breaching the uterine serosa and invading pelvic tissues/organs (with or without invasion of the bladder)

*For the purposes of this classification, "uterus" includes the uterine body and uterine cervix


US and/or MRI suggest at least one feature of PAS
Consensus on predicted clinical (FIGO) stage at delivery (by 30 wk)
[Prof. S Robson/Dr T. Hannon + Dr. E. Whitby]
FIGO 0 (dehiscence)
FIGO 1 (accreta)
FIGO 2 (increta) or FIGO 3 (percreta)
Obstetrician
Obstetric Anaesthetist
Midwife Lead
Sister (Gynae theatre)
e-MDT Meeting (by 32 wk)
Notification of plan
Gynaecologist
Interventional Radiologist
Neonatologist
Consent for elective procedure
@ 35 wk for FIGO 2/3
@ 37 wk for FIGO 0/1
Consent for emergency procedure
Plan for admission
Optimise Hb (aim ≥ 110 g/L)
MDT Meeting (by 32 wk)
Obstetrician
Gynaecologist
Midwife Lead
Interventional Radiologist
Obstetric Anaesthetist
Neonataologist
Sister (Gynae theatre)
Neuroaxial anaesthesia
SPT incision (Midline incision in selected cases)
Neuroaxial anaesthesia (GA in selected cases)
Cystoscopy + ureteric stents
IR (Internal Iliac Artery Balloon Catheters)
Midline skin incision (SPT incision in selected cases)
FIGO 0/1 confirmed
FIGO 2/3 confirmed
No desire for future pregnancy
Focal FIGO 2/3a
Desire for future pregnancy
Lower segment hysterotomy
Removal of placenta
+/- LS Compression Suture
Persistent haemorrhage
General anaesthesia
Upper segment hysterotomy
(avoiding placenta)
Total hysterectomy
(with placenta left in situ)
Upper/lower segment hysterotomy
Resection of invaded myometrium
(with removal of placenta)
+/- LS Compression Suture