

Evaluation of Caesarian Section Scar Tissue using Special Stains and Immunohistochemical Methods



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Introduction
Prior Caesarian section C/S results in chronic dysfunctional changes in the lower uterine segment. Emergency C/S in particular may be associated with conditions that cause the incision repair to be sub-optimal. The scar may remain symptomatic. Pathologists see considerable variation in the morphology of the repair, sometimes with persistent inflammatory foci many years after the last C/S. Implantation endometriosis is a common finding, often with cystic adenomyosis, and this may be a cause of pain and post-menstrual spotting. Persistent chronic inflammation with incomplete healing and continuing repair will leave the incision site weak and liable to rupture or stretch in a subsequent pregnancy. Ectopic implantation on or in the scar niche may result in early, intermediate or late severe life-threatening haemorrhage and morbidity.

Method 1
Histology slides were stained with H/E for general morphology, Masson Trichrome, Pentachrome, Millers Elastic and Gordon & Sweets Reticulin stains for connective tissue components and Picro Sirius Red stain as a semi-quantitative stain for collagen. Immunohistochemical stains selected were Anti-Vimentin for endometrium, Anti-Smooth muscle Actin for blood vessels, Anti-Desmin for myometrial muscle and Anti-Collagen 111 for structural and scar collagen.



Tenting defect and thinning of the anterior lower segment. (Two scars). The cavity (niche) extends laterally and mucosa is very congested



Long thin defect following Interval pregnancy
note- No distinct Niche



Endometrial Ablation for symptoms
Hysterectomy for No Relief



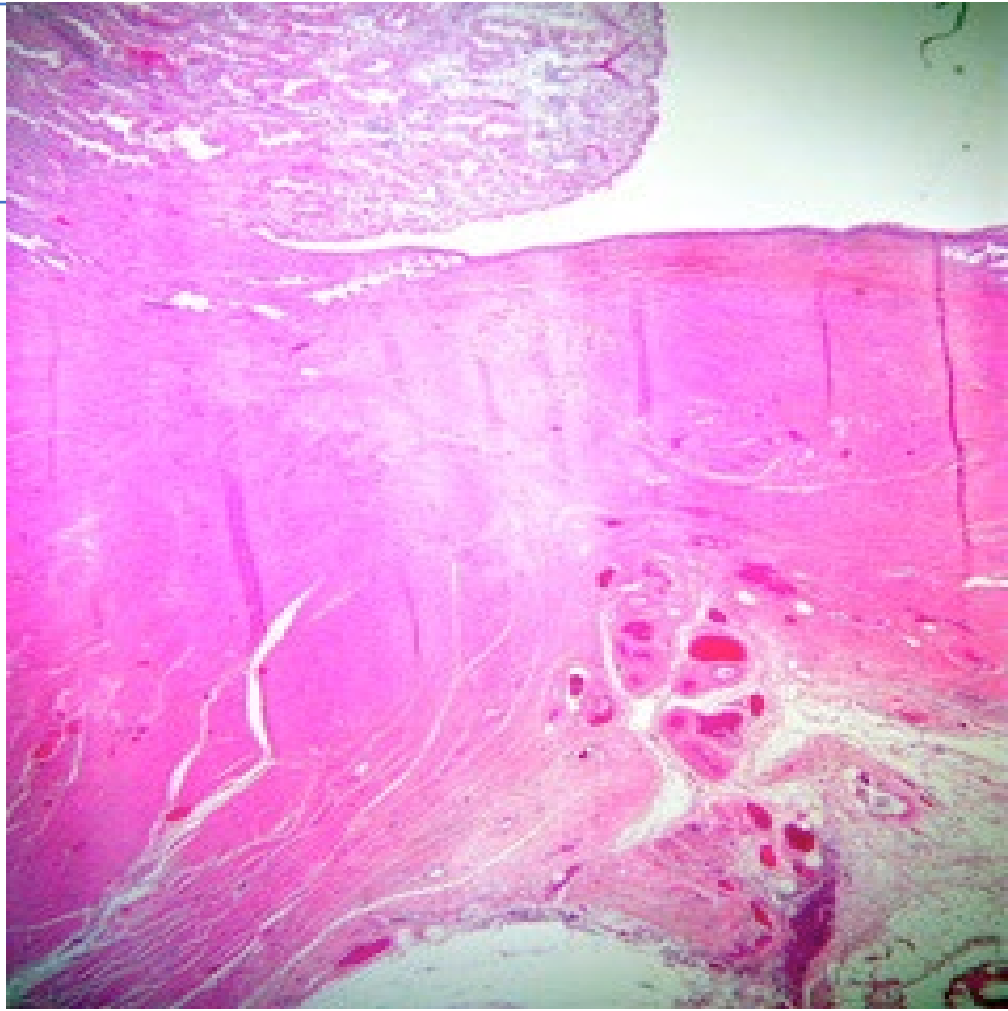
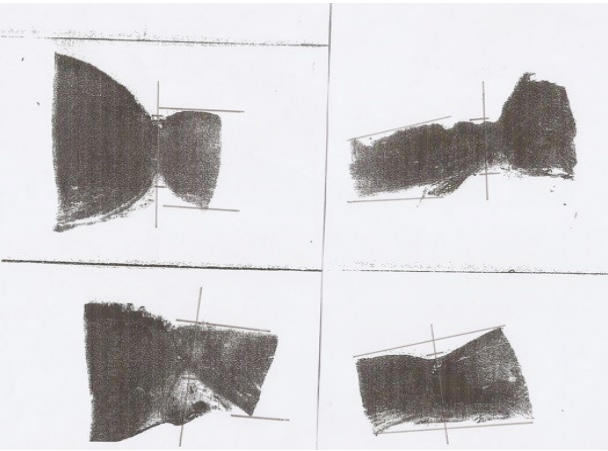
Very thin scar at
Apex of defect

Microscopic appearance of C/S scar defects
H&E stains

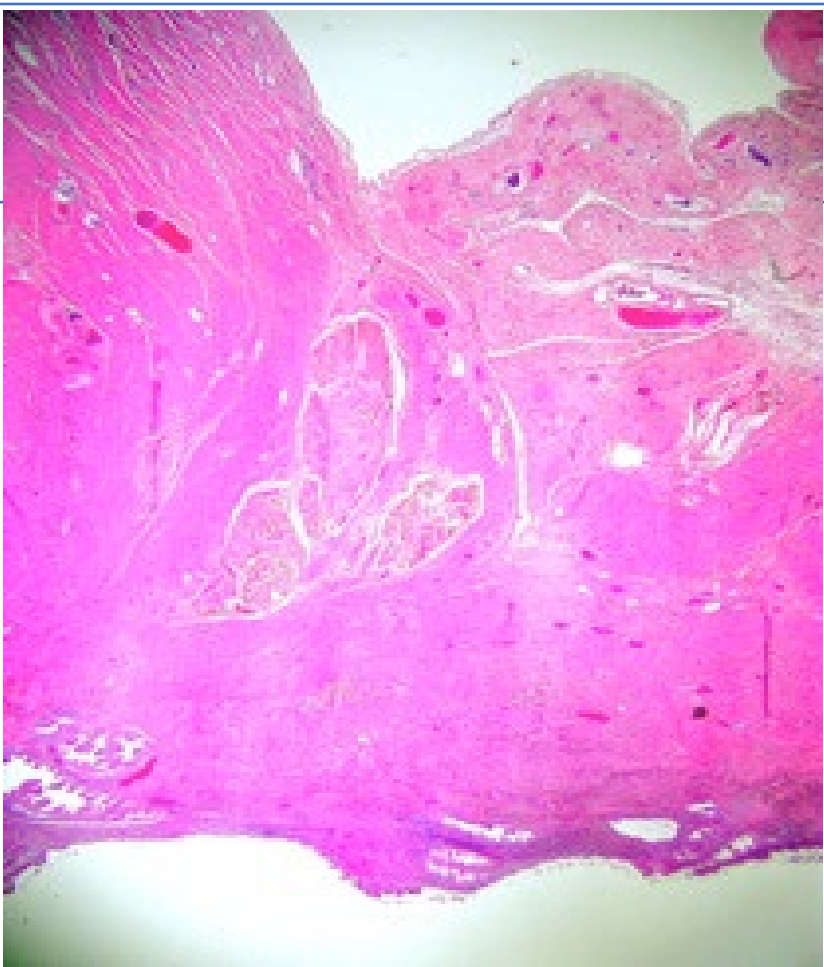
Findings
Anti-Desmin, specifically staining myometrial muscle bundles and Picro Sirius Red specifically staining scar collagen separately and in combination were the most useful and consistent staining methods in establishing the varying components in the scars. Reticulin collapse and Elastin deposition were useful in establishing evidence of involution of old placental site. Anti-Collagen III was not consistent and Anti-Vimentin was not necessary to identify endometriosis. In the scar tissue residual suture material and debris were seen in a number of cases and in 31% (7 of 22 scars), an associated foreign body giant cell reaction was present. Based on our subjective interpretation of scar strength and elasticity we classified 10 of 22 scars as weak.

Method 2
Histology slides were photocopied on the glass platen of a photocopier And then enlarged to 4 times magnification. Measurements of the lower segment were made on the photocopies

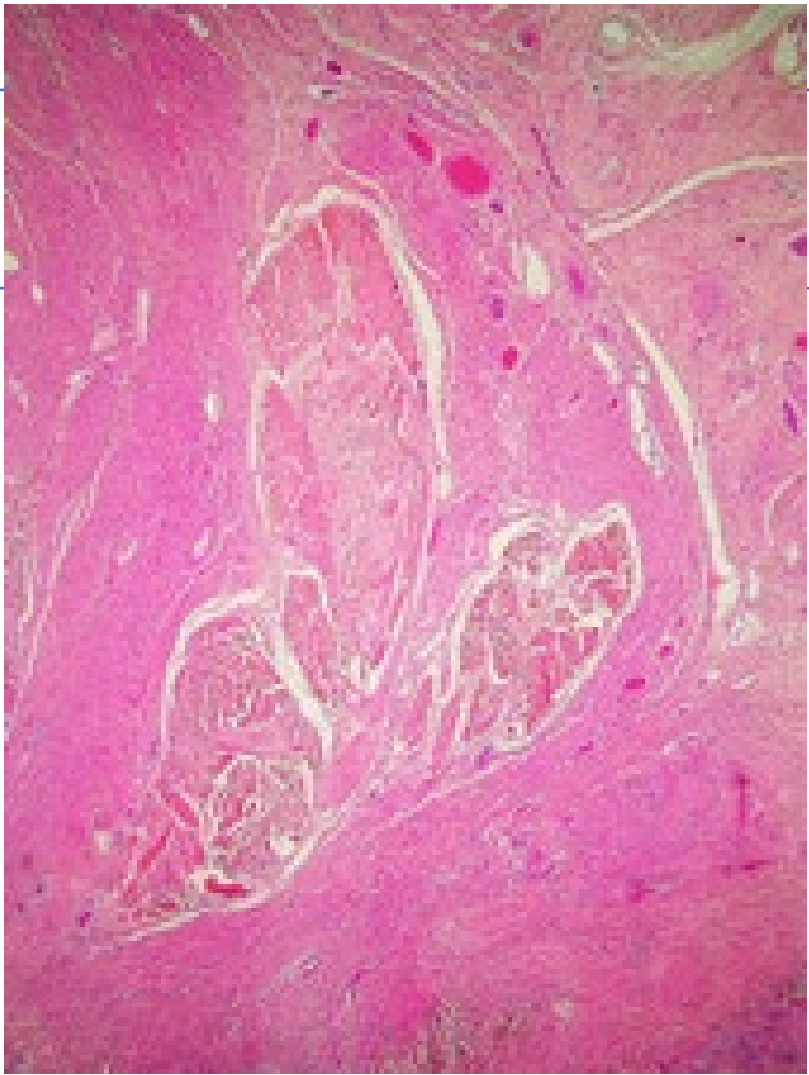
Measurements: Mean thickness of anterior wall of lower segment:
Control Uteri: 1.5cm. (range 1.4-1.5)
Scarred Uteri: 0.47cm. (range 0.2-1.5)



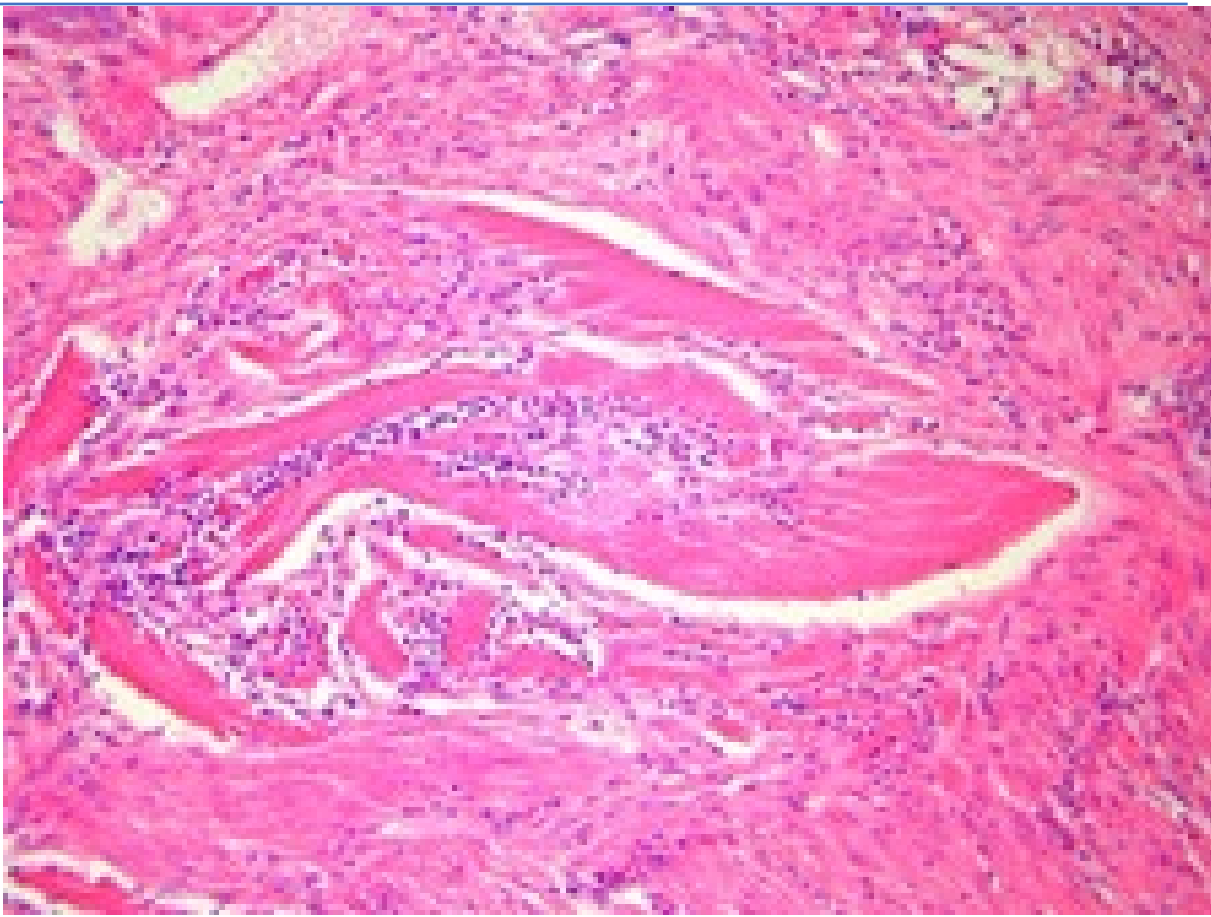
H/E 10 mag. C/S scar niche
Secretory endometrium



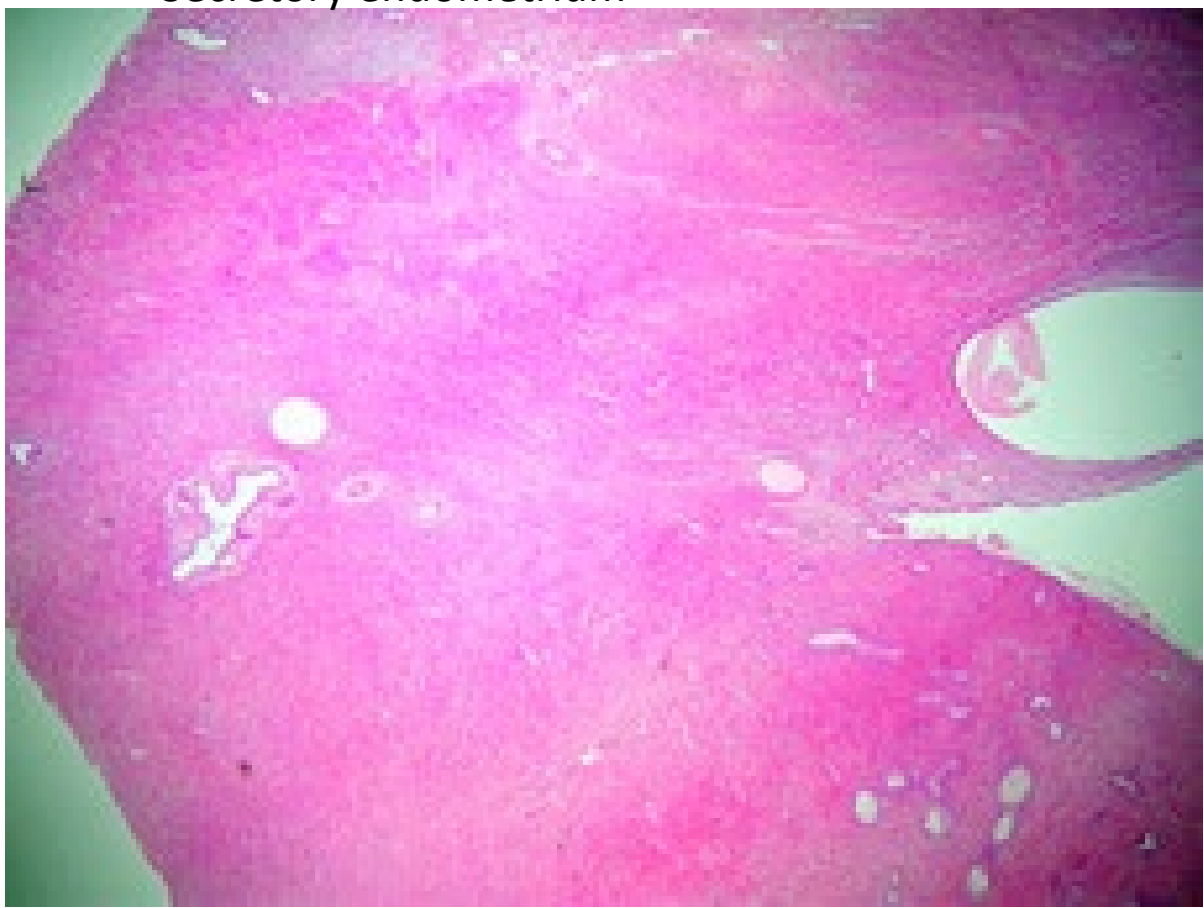
H/E 20 mag old C/S scar



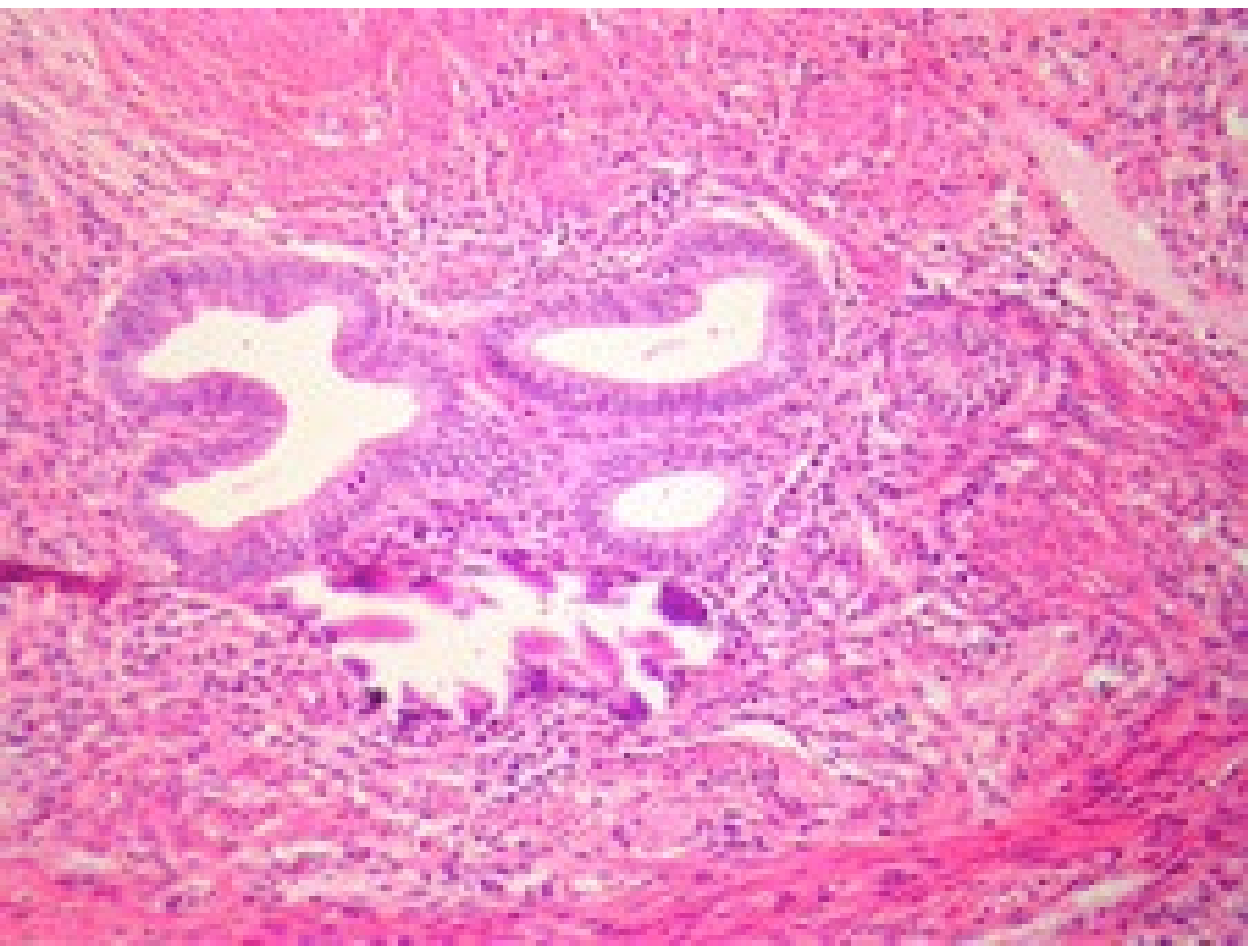
H/E 40X Mag. Note the Knot



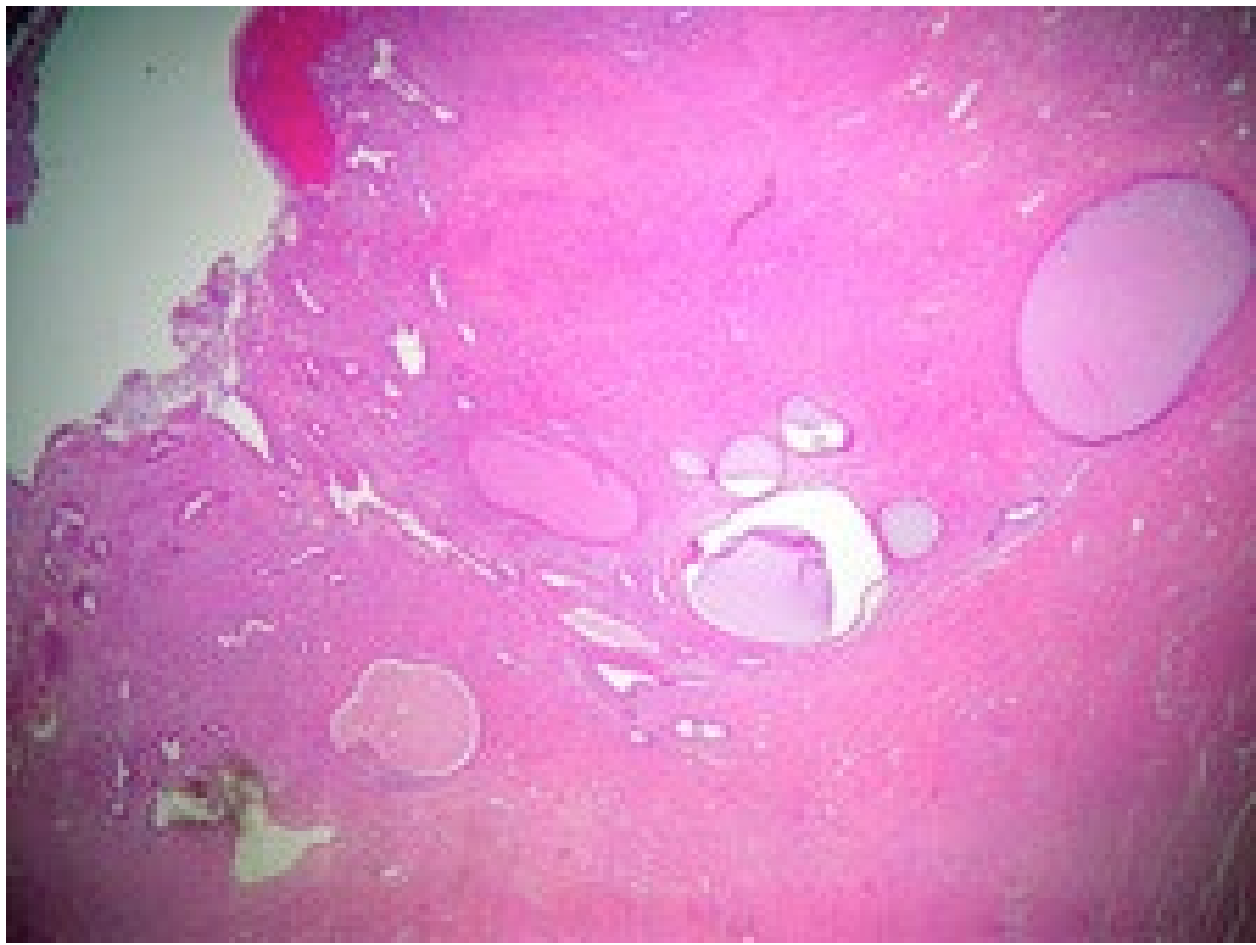
H/E 100mag. Stitch with
Residual inflammation



H/E stain Low power

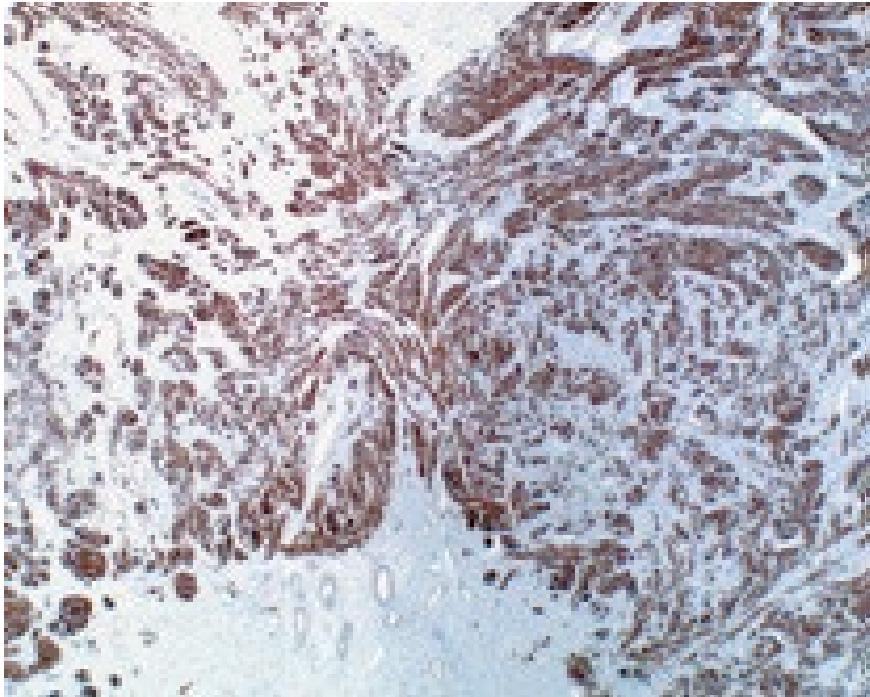


H/E 40X Mag. Endometrial Glands, Inflamed Stroma and Calcification

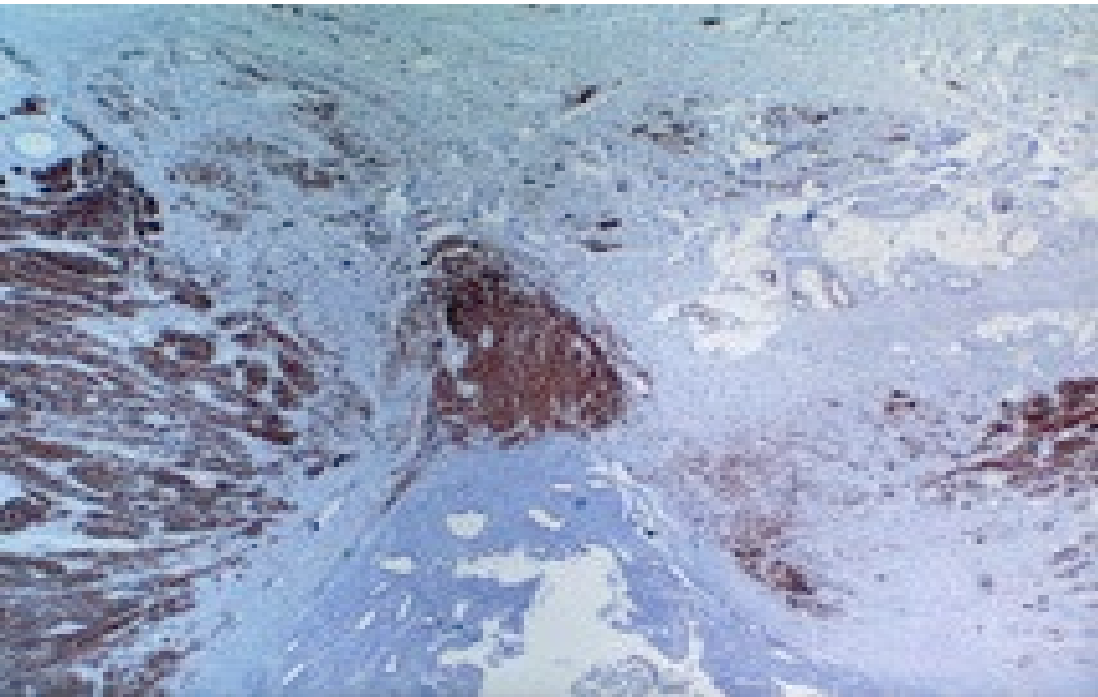


H/E stain low Power Endometriosis and Adenomyosis

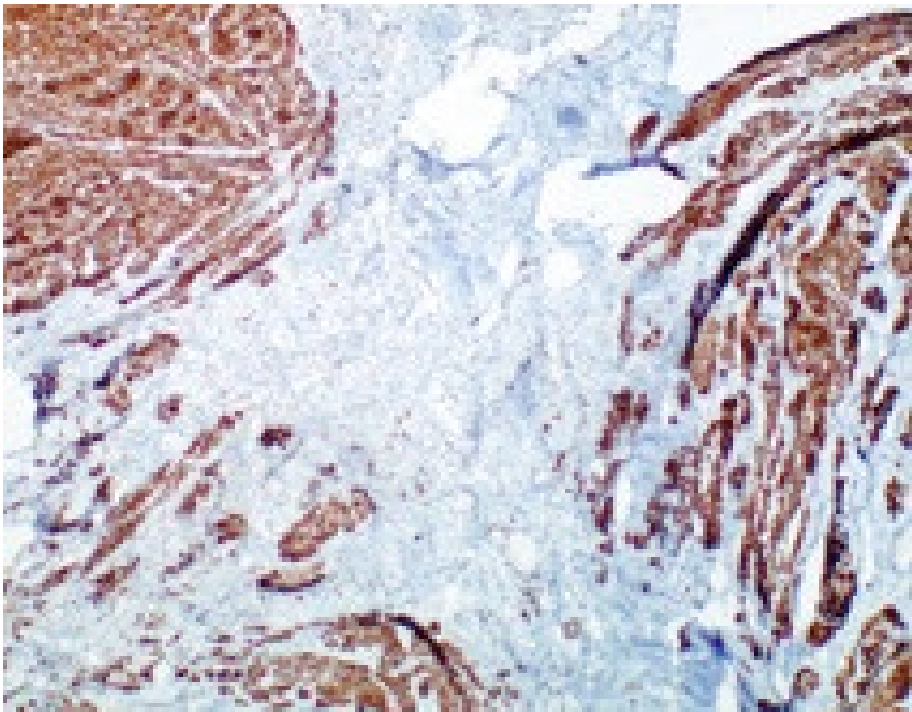
Endometriosis in the stroma of C/S scars



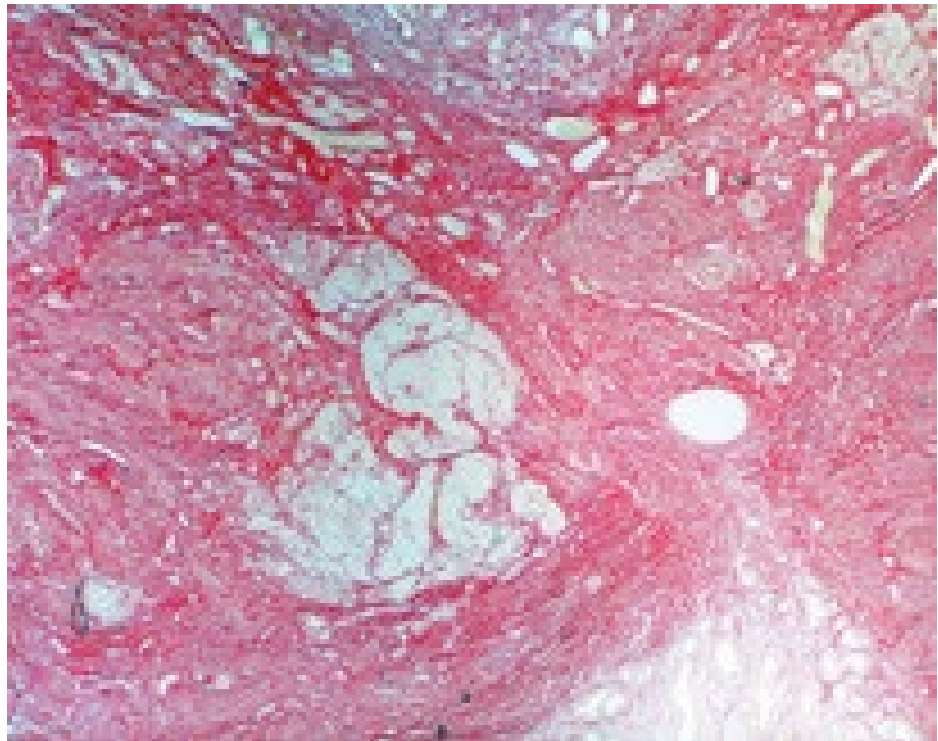
Desmin 20xmag. Good quality scar



Desmin 20Xmag. Poor scar with separated muscle

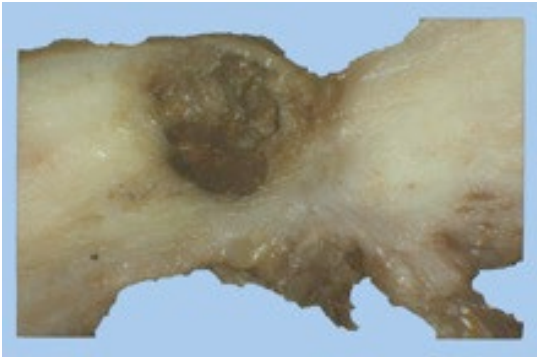


Desmin 40Xmag. Poor scar in collagen

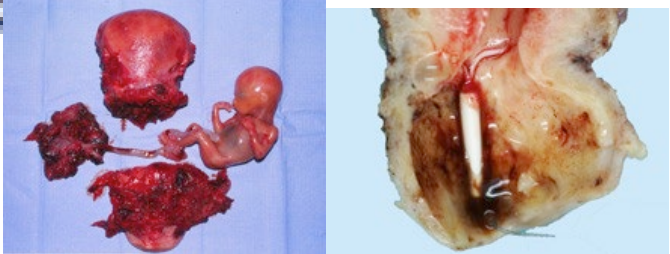


40Xmag. Picro Sirius Red Specific for collagen

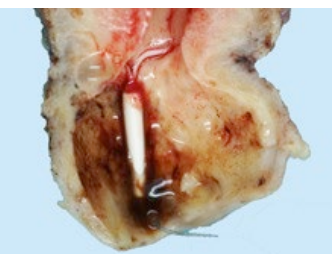
Consequences of
Caesarean scar defects



Cervical C/S Scar Ectopic



Sec. Trim. loss



Cx Impacted Coil



Peripartum Hyst



Ablation Preg



Conservative Management 2 months Post Partum

Conclusions

The recent substantial increase in placenta praevia accreta is associated with changing practice in Obstetrics. Chromic catgut suture has been largely replaced by synthetic sutures with different properties. Three layer closure is replaced by one, as the rates of C/S are increasing, the seniority of the operator is often decreasing. Stitch tension and oedema can cause myonecrosis and incisional necrosis.

Any cause of chronic inflammation will weaken a scar and predispose to stretching, diverticulum and rupture. In the developing world today, in some countries, C/S is the commonest major surgical operation and the procedure is performed often by surgical trainees called at a moments notice from the adjacent general hospital. The appropriate follow up may be sadly lacking.

References
1. Evaluation of Caesarian scar tissue using Immunohistochemical methods and special stains. BSc. Biomedical Science Thesis 2007 School of Biological Sciences Dublin Institute of Technology Kevin St. Dublin Ireland
2. A Comprehensive Textbook of Postpartum Haemorrhage 2nd Ed. 2012 chapter 59, pages 491-493. (at www.glowm.com)