Links to Studies identifying problems or lack of benefit from single layer closure

A1        A2        A3        A4

Links to Sutdies recommending switich to single layer closure (note none of these include long term follow-up for VBAC and acknowledge some detriment  or  a case of uterine rupture

B1       B2        B3        B4        B5        B6        B7

Uterine rupture during a trial of labor after a one- versus two-layer closure of a low transverse cesarean.

Emmanuel Bujold, Camille Bujold, Robert J. Gauthier; Ste-Justine Hospital,

University of Montreal, Obstetrics and Gynecology, Montreal, Quebec.

Objective: To determine whether there is a difference in the rate of symptomatic uterine rupture during a trial of labor (TOL) in women who had a 1-versus a 2-layer closure of a low transverse cesarean section (LTCS).

Study Design: Medical records of all women who had a TOL after LTCS between 1990 and 2000, in our institution were reviewed. The rates of uterine rupture were compared between women who had a 1-layer at their previous cesarean section with those who had a 2-layer closure. Multivariate logistic regression analyses were used to control for maternal age, birth weight, gestational age, use of epidural, induction of labor, oxytocin augmentation, prior vaginal delivery and prior cesarean section for arrest disorders.

Results: There were 1649 women included in the study.  Women with a previous 1-layer closure (n=398) had a rate of uterine rupture of 3.3%, whereas those with a previous 2-layer closure (n=1251) had a rate of uterine rupture of 0.6% (p<.001).  The odds ratio for uterine rupture in women with a 1-layer closure was 5.2 (95% confidence interval, 2.1 to 12.8).

Conclusion: A 1-layer closure at the previous LTCS is associated with a 5-fold greater risk of uterine rupture during a trial of labor for the subsequent delivery than a 2-layer closure.

Abstracts of the 2001 21st Annual Meeting of the Society for Maternal-Fetal Medicine. American Journal of Obstetrics and Gynecology (supplement) 184(1):S18, 2001.

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Zentralbl Gynakol 1995;117(1):40-4

Modified Sarafoff suture for single layer closure of uterotomy in cesarean section. [ A prospective study].

[Article in German] Heidenreich W, Bruggenjurgen K. Frauenklinik des Allgemeinen Krankenhauses Celle.

125 caesarean sections were performed at the Department of Obstetrics and Gynecology, Allgemeines Krankenhaus Celle, during the last 6 months of 1991. The caesarean section rate was 13.4% (930 deliveries in that period).--For closure of the uterotomy a two-layer suture was applied (62 patients) as well as a one-layer suture, the modified Sarafoff suture (63 patients). Both techniques were used alternatively. We compared intraoperative and postoperative courses of the two groups of patients in a prospective study. Between the 8th and 10th day after surgery an ultrasonic examination of the scar was performed. The data in both groups did not show any significant difference, except that the scar in the one-layer group was thinner.--So, our results did not support an advantage of the one-layer suture as compared to the two-layer technique.

PMID: 7879462 [PubMed - indexed for MEDLINE]

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Am J Obstet Gynecol 1988 Oct;159(4):807-10

Comment in: Am J Obstet Gynecol. 1990 Mar;162(3):866

Unknown uterine scar and trial of labor.

Pruett KM, Kirshon B, Cotton DB.Department of Obstetrics and Gynecology, Baylor College of Medicine, Houston, TX 77030.

A review of 393 patients undergoing trial of labor after one or more previous cesarean sections was performed. Three hundred patients had an unknown uterine scar, 88 patients had a documented low cervical transverse incision, and five patients had a prior low vertical incision. The rate of vaginal delivery and maternal and fetal morbidity was no different in those patients with an unknown prior uterine incision compared with those having a known prior low cervical transverse incision.

In 66 of the patients with a documented low cervical transverse incision, the original operative record was reviewed in regard to single-layer closure of the uterine incision versus double-layer closure or imbricating technique. No patient with a double-layer uterine closure had a subsequent dehiscence, whereas three patients with a prior single-layer closure exhibited scar separation.

These data suggest that neither an unknown scar nor a single-layer uterine closure places the mother or fetus at greater risk.

PMID: 3177527 [PubMed - indexed for MEDLINE]

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Baillieres Best Pract Res Clin Obstet Gynaecol 2001 Feb;15(1):17-47

Techniques for performing caesarean section.

Hema KR, Johanson R. North Staffordshire Hospital NHS Trust, Stoke on Trent, ST4 6QG, UK.

In many countries caesarean section has become the mode of delivery in over a quarter of all births. Safety of the mother and cost are the two main areas of concern. Various studies on the techniques of performing a caesarean section have focused on reducing the operating time, blood loss, wound infection and cost. Given the fact that caesarean section is the most commonly performed operation in obstetrics, it is important that trainers and trainees are familiar with the basic surgical techniques and that best practice is followed. At the same time surgeons should take necessary precautions to reduce their risk of exposure to Hepatitis B and HIV. The skin incision and entry into abdominal cavity is best achieved by the modified Cohen's incision. The lower segment transverse uterine incision has stood the test of time over a period of 75 years and remains the best way to enter the uterus. Closure of the uterus in single layer appears to be acceptable, whenever technically possible. Placental delivery should be by controlled cord traction after spontaneous expulsion. Closure of the visceral and parietal layers of the peritoneum no longer seems to be necessary. Obliteration of space in the subcutaneous layer, either by suture or by suction, seems to reduce wound disruption. These issues are being considered in the CAESAR randomized controlled trial of surgical techniques currently underway in England.Prophylactic antibiotics are mandatory in preventing post-operative morbidity. Many of the above mentioned steps have been tested in randomized trials. Further studies are needed to examine a wide range of questions arising from this review, e.g. best position of the patient, the value of exteriorization of the uterus whilst repairing the uterus, and the use of agents to relax the uterus in difficult deliveries. Copyright 2001 Harcourt Publishers

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PMID: 11359313 [PubMed - indexed for MEDLINE]

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Int J Gynaecol Obstet 2001 Feb;72(2):135-43

Can Joel-Cohen incision and single layer reconstruction reduce cesarean section morbidity?

Ferrari AG, Frigerio LG, Candotti G, Buscaglia M, Petrone M, Taglioretti A, Calori G. Department of Obstetrics and Gynecology, University of Milan, Milan, Italy.

OBJECTIVE: To compare an innovative cesarean section based on Joel-Cohen incision with the traditional Pfannenstiel technique in terms of operative data and post-operative recovery.

METHOD: Out of 158 randomized patients, 83 patients underwent the innovative cesarean section (Joel-Cohen incision, one-layer locked uterine suture, no peritoneization) and 75 the traditional operative approach (Pfannenstiel incision, double layer closure of the uterus, visceral and parietal peritoneization). Operative data and post-operative morbidity were compared; sample size was calculated to detect a 13% difference in the occurrence of post-operative fever with a statistical power of 80%.

RESULT: Post-operative fever was not different in the two groups. Total operating time was shorter with the innovative technique: 31.6 +/-1.38 min vs. 44.4+/-1.44 (P=0.0001) and fewer sutures were used: 3.6+/-0.13 vs.6+/-0.13 (P=0.001). Patients operated by the new technique began moving sooner and intestinal function restarted earlier.

CONCLUSION: The proposed technique made for shorter operating times and faster recovery but no decrease in puerperal morbidity.

 PMID: 11166746 [PubMed - indexed for MEDLINE]

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Obstet Gynecol Surv 1996 Jul;51(7):445-51

Refinements in performing a cesarean delivery.

Rayburn WF, Schwartz WJ 3rd. Department of Obstetrics and Gynecology, University of Oklahoma College of Medicine, Oklahoma City, USA.

Several refinements in performing a cesarean delivery have been proposed in recent years. The surgeon is now more aware of the potential of HIV virus exposure and is inclined to use techniques to minimize contact with sharp objects. Wide incisions of the skin and fascia are encouraged for greater ease in delivering the fetus. When possible, a low transverse uterine incision is attempted to allow for an improved chance of undergoing successful labor with any subsequent pregnancy. Spontaneous delivery of the placenta may reduce blood loss and decrease the chance of postoperative endometritis. Single layer closure of the uterus without closure of the peritoneum is as safe and effective as a two-layer closure. Not closing the visceral or parietal peritoneum appears to be an acceptable alternative. Superficial wound disruption may be minimized by either closing large, nondraining subcutaneous spaces or using continuous drainage. Limitations with descriptive experiences and randomized clinical trials should be appreciated when translating this information into routine surgical practice.

 PMID: 8807645 [PubMed - indexed for MEDLINE]

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Cochrane Database Syst Rev 2000;(2):CD000192

Single versus two layer suturing for closing the uterine incision at caesarean section.

Enkin MW, Wilkinson C. Department of Obstetrics and Gynaecology, Mc Master University, 1200 Main Street West, Hamilton, Ontario, Canada, L8N 3Z5. enkin@fhs.csu.mcmaster.ca

BACKGROUND: A single layer closure might save operating time, disrupt less tissue, introduce less foreign material into the wound, and thus result in less post operative morbidity.

OBJECTIVES: The objective of this review was to assess the effects of a single layer closure of the uterine incision at caesarean section, in contrast to conventional two layer closure.

SEARCH STRATEGY: We searched the Cochrane Pregnancy and Childbirth Group trials register.

SELECTION CRITERIA: Randomised trials of single layer closure, either interrupted or continuous, compared to two layer closure with continuous sutures in pregnant women undergoing elective or emergency caesarean section.

DATA COLLECTION AND ANALYSIS: One reviewer assessed trial quality and extracted data.

MAIN RESULTS: Two trials involving 1006 women were included. Based on one trial, single layer closure was associated with reduced operating time (5.6 minutes). Based on one trial, radiographic scar appearance showed fewer scar defects at three months with the single closure group. There were no statistically significant differences in the use of extra haemostatic sutures, incidence of endometritis, decrease in post operative haematocrit or use of blood transfusion.

REVIEWER'S CONCLUSIONS: There appear to be no advantages or disadvantages for routine use of single layer closure compared to two layer closure, except perhaps a shorter operation time.

PMID: 10796177 [PubMed - indexed for MEDLINE]

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Akush Ginekol (Sofiia) 1999;38(3):10-3

[Single-layer or double-layer suturing of the uterine incision in cesarean section]?

[Article in Bulgarian] Iankov M.

The aim of the study is to compare the early complications after '/' cesarean section due to the way of closure of a low transverse uterine incision--single layer or two layers. MATERIAL AND METHODS: We investigated retrospectively in the clinical data (history of birth) 450 women with cesarean section: 300 with single layer and 150--with two layers> The hysterotomy was closed by suture with cat-gut plain No. 2 or chromic No. 1 or No. 2.

Results showed single layer repair of the uterus is connected with better postoperative prognosis: low rates of febrile morbidity and wound infection, shorter hospitalization time, better involution of the uterus, p ^ 0.05. We had no dehiscence and secondary bleeding in both ways of repair, so relaparotomy wasn't needed.

CONCLUSION: Single-layer closure has advantages compared to two-layers closure that is why it is recommended for wider application.

PMID: 10734669 [PubMed - indexed for MEDLINE]

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J Reprod Med 1993 May;38(5):393-6

Continuous, nonlocking, single-layer repair of the low transverse uterine incision.

Jelsema RD, Wittingen JA, Vander Kolk KJ. Department of Obstetrics and Gynecology, College of Human Medicine, Michigan State University, Butterworth Hospital, Grand Rapids 49503.

Continuous, locking, single-layer closure of the low transverse uterine incision has been used, with a reportedly decreased risk of endometritis, decreased operating time and no increased risk of rupture with subsequent vaginal birth when compared with the more traditional, two-layer repair. However, in other tissues, such as fascia and skin, locking sutures cause increased tissue damage and weaker scars. We decided to determine the safety in the perioperative period of continuous, nonlocking, single-layer repair. Over a six-month period, 100 patients who had continuous, nonlocking, single-layer repair of their low transverse uterine incisions were compared with 100 matched controls who had the traditional, two-layer repair of a locking suture followed by an imbricating layer. Febrile morbidity, rates of endometritis, blood loss, requirements for additional hemostatic sutures and operating times were compared.

Except for increased additional hemostatic suture use and decreased operating times in the single-layer group, we found no differences between the two methods. The continuous, nonlocking, single-layer technique is not only expedient and cost efficient but also safe in the perioperative period. It has the additional theoretical advantage of less tissue damage, which may result in a stronger wound and thus in a reduced risk of rupture with subsequent labor.

PMID: 8320678 [PubMed - indexed for MEDLINE]

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Int J Gynaecol Obstet 1988 Dec;27(3):349-52

Comparative study of single layer and conventional closure of uterine incision in cesarean section.

Lal K, Tsomo P.Department of Obstetrics and Gynaecology, Government Medical College, Jammu, Kashmir State, India.

Single layer interrupted suture closure of uterine wound incisions represent a viable choice over conventional closure since the operation not only has benefits in case of performance but also possesses a rational basis for the avoidance of ischemia of the wound, infection and hematoma formation. There is a distinct advantage of single interrupted suture closure over conventional closure because there is a substantially higher number of normal hysterograms in this group showing good integrity of the scar in the uterus.

PMID: 2904896 [PubMed - indexed for MEDLINE]

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Aust N Z J Obstet Gynaecol 1988 May;28(2):96-8

A new technique for closure of the uterus at caesarean section.

Sivasuriya M, Sriskanthan R, Sriskandarajah MN.Department of Obstetrics and Gynaecology, University of Jaffna, General Hospital, Sri Lanka.

A new method of closure of the uterus at Caesarean section is described. The technique which comprised suturing the uterine incision in a single layer was employed in 100 patients, in all of whom there was also a valid indication for sterilization. Apart from being simple, safe and effective the main advantage of the technique appeared to be saving operating time. A noteworthy feature was that the incidence of postoperative complications was no higher compared with the standard 3-layer suture of the uterus.

PMID: 3265871 [PubMed - indexed for MEDLINE]

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Zentralbl Gynakol 1986;108(17):1039-45

[Clinical experiences with a single layer uterine suture in cesarean section].

[Article in German]Winkler M, Ruckhaberle KE, Saul S, Forberg J.

In this analysis 536 caesarean sections with a single layer uterine suture were compared to 256 sections with two layer closure. Their relations with regard to indications of operative delivery, complications during the puerperium and their courses in subsequent vaginal deliveries were taken into consideration. - The significant lower rate of pyrexia and shorter hospital stay of the patients may be a result of quicker and better healing of the single layer suture. The increased rate of complications in the puerperium is partially due to changes in the registry of dates. Absent disturbances during the placental period and the occurrence of only one uterine rupture, in the course of vaginal delivery in a patient with a previous single layer caesarean section suture, demonstrates the functional sufficiency of this technic.

PMID: 3538711 [PubMed - indexed for MEDLINE]

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Am J Obstet Gynecol 1992 Oct;167(4 Pt 1):1108-11

Transverse uterine incision closure: one versus two layers.

Hauth JC, Owen J, Davis RO.Department of Obstetrics and Gynecology, University of Alabama, Birmingham 35233-7333.

OBJECTIVE: Closure of a low transverse cesarean incision with one layer of suture results in less operating time, better hemostasis, and less infectious morbidity than a two-layer closure. STUDY

DESIGN: At our institution 906 women were randomized to closure of a low transverse cesarean incision with either one continuous layer of a locking No. 1 chromic suture and a CTX needle (n = 457) or two continuous layers of No. 1 chromic suture with the first layer locked (n = 449). The Student t test, chi 2 test of proportion, and Wilcoxon rank sum test were used to compare groups of patients.

RESULTS: A one-layer closure required less operative time, 43.8 versus 47.5 minutes (p = 0.0003). Fewer additional uterine hemostatic sutures were required in 369 women in whom either the one- (n = 179) or the two-layer (n = 190) closure did not achieve hemostasis (p = 0.046). Endometritis was similar in both groups, 83 (22%) in the one-layer group versus 65 (18%) in the two-layer group (p = 0.17). In no outcome assessment was the two-layer closure superior to the one-layer closure.

CONCLUSION: We recommend a one-layer closure when its use is anatomically feasible.

 PMID: 1415400 [PubMed - indexed for MEDLINE]

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Geburtshilfe Frauenheilkd 1987 Feb;47(2):117-20

[The single-layer uterine suture in cesarean section. A comparative study].

[Article in German] Tischendorf D.

Caesarean section had to be carried out in 297 cases (4.9 per cent) out of 6064 births (infant mortality 0.44 per cent). A comparison between 96 Caesarean sections with a one-layer suture of the myometrium (32 per cent) and 201 Caesarean sections with a two-layer suture (68 per cent) clearly shows less morbidity (19 per cent vs. 37 per cent) in case of a one-layer uterus suture. In those cases the postoperative loss of blood, the involution of the uterus and the healing of the scar are also more favourable. Afebrile courses clearly predominate in one-layer sutures (92 per cent to 76 per cent in two-layer sutures). Most important of all are the ability and experience of the surgeon, not the use of antibiotica.

PMID: 3552857 [PubMed - indexed for MEDLINE]

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Ginekol Pol 2000 Sep;71(9):1124-9

[Changes in the methods of cesarean section].

[Article in Polish] Lach J, Marcinkowski Z, Marcinkowski R, Lisiak M.Oddzialu Poloznictwa i Patologii Ciazy Szpitala Miejskiego im. dr. E. Warminskiego w Bydgoszczy.

OBJECTIVE: To evaluate the effects of leaving the visceral peritoneum open and hysterotomy closing by a one-layer continuous locked.

MATERIALS AND METHODS: The analysis of 868 women underwent caesarean section had been performed. All operated patients were divided into three compared groups. 268 women operated between 01.05.96 and 31.01.97, belonged into I group, which had the visceral peritoneum sutured during caesarean section, in comparison to the II group operated between 01.05.97-31.01.98 (n = 280), which had only one modification in surgical procedure--the visceral peritoneum was left unsutured and to the group operated between 01.05.98-31.01.99 (n = 320) with second modification--the hysterotomy was closed by a one-layer

continuous locked.

RESULTS: The average operating time was significantly shorter at group II and III. After surgery we have not observed significant differences in frequency of febrile morbidity (6.34% in I group, 8.93% in second group and 8.44% in third group) and postoperative complications (respectively 9.33; 11.07 and 10.63%).

CONCLUSIONS: Non-closure of the visceral peritoneum and closure of the hysterotomy by a one-layer continuous locked has no influence on the number of the post surgical complications. Modifications method of cesarean section showed significantly decreased operative time and chirurgical (i.e., "surgical") materials use.

PMID: 11082988 [PubMed - indexed for MEDLINE]

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Items 1-20 of 168

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Transverse uterine incision closure: one versus two layers.

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BMJ. 2000 Apr 15;320(7241):1073; discussion 1074. No abstract available.

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