

Editorial

Single Layer Uterine Closure in Cesarean Section

Cesarean section aims at reducing maternal and fetal mortality and morbidity by virtue of its cautious and careful approach, which has made it a common practice in modern obstetrics. In many countries, cesarean section has become the mode of delivery in over a quarter of all the births. Due to the large number of cesarean sections performed, it has become necessary for practicing obstetricians to pay attention to the minute technical aspects of the procedure in order to reduce the complication rate without compromising the quality of the surgery. The main areas of focus are reduction in operating time, blood loss, wound infection and cost. It is important that trainers and trainees are familiar with the basic surgical techniques and the best practice is followed. There are several controversial issues as far as the technical aspects of cesarean section are concerned, one of the important ones being single vs double layer uterine closure during a cesarean section. The strength of the scar and risk of scar rupture in subsequent pregnancies is the main area of focus in this respect.

The risk of scar rupture varies with the type of uterine scar. The commonest estimated risk is 2.2% for classical scar and 0.5% for lower segment scar. Majority of cesarean sections are now performed through a lower segment uterine incision, which has stood the test of time over a period of 75 years and remains the best way of entering the uterus. Several ways of uterine closure have been described viz :

- Single layer suturing.
- Double layer suturing
- Intermittent sutures.
- Continuous sutures.

Single layer suturing seems to be acceptable whenever technically possible. Various studies have been carried out to evaluate the risks and benefits of single layer uterine closure and performance in subsequent pregnancy. A recent study by Durnwald and Mercer¹ involved a retrospective analysis of 768 women who

delivered their first live born infants by primary cesarean section from 1989 to 2001. One hundred sixty seven women had single layer and 501 had double layer uterine closure. Single layer closure was associated with decreased blood loss (646 vs 690 ml; $p < 0.01$) operative time (46 vs 52 minutes; $p < 0.001$), endometritis (13.5 vs 25.5%; $p < 0.001$) and postoperative hospital stay (3.5 vs 4.1 days; $p < 0.001$) as compared to double layer closure. In second pregnancy, prior single layer closure was not associated with uterine scar rupture after a trial of labor (0% vs 1.2%; $p = 0.30$) nor with other maternal or infant morbidities. Prior single layer closure was associated with more uterine window (3.5% vs 0.7%; $p = 0.046$) at subsequent cesarean delivery. They used continuous nonlocking suture employing vicryl. They concluded that single layer uterine closure is associated with reduced infectious morbidity in the index surgery and not with increased uterine rupture and other adverse outcomes in subsequent pregnancies. All the windows were found only after a trial of labor. It is not known whether these windows would have progressed to uterine rupture with prolonged trial or in a subsequent pregnancy. To be on the safe side the authors suggest double layer closure for women planning a trial of labor in future.

Contrary to the above data, Bujold et al² and colleagues in a study of 2142 patient with previous cesarean section concluded that single layer closure of previous lower segment incision was the most influential factor and was associated with a four fold rise in the risk of uterine rupture compared to double layer uterine closure. However as pointed out by Durnwald and Mercer¹ they employed chronic catgut rather than vicryl. Further Bujold et al² used continuous locking stitch which possibly causes vascular occlusion and poor wound healing according to Cruickshank³.

Chapman et al³ and Tucker et al⁴ report no adverse outcomes with single layer closure and no increased risk of uterine rupture during a trial of labor in subsequent pregnancy. A cochrane review⁷ found no advantage or disadvantage of single layer closure except shorter operating time.

The other important issue of concern is continuous vs interrupted sutures for single layer closure of uterine incision. Hohlagschwandtner et al⁶ conducted a study of 82 women undergoing cesarean section, with single layer closure - 38 with continuous sutures and 43 with interrupted sutures. There were significant differences in total operating time (32 vs 40 minutes) and in the pre and postoperative hemoglobin levels (Delta Hb 0.6 vs 1.1). But there was no significant difference in sonographically diagnosed hematomas. They concluded that single layer continuous closure saves operating time, reduces blood loss and introduces less foreign material into the wound.

On the basis of current literature it can be said that single layer closure saves blood lost and operating time, and reduces perioperative morbidity when compared to double layer closure, use of vicryl in preference to catgut is strongly recommended and so is the continuous nonlocking stitch. Whether single layer closure increases the possibility of uterine rupture in next pregnancy is an unsettled issue which is not surprising since a review of nearly 4000 cases would be needed to have necessary power for the study to convince whether possibility of rupture in next pregnancy is doubled. Hence it may be prudent to us double layer closure for women who are likely to undergo a trial of labor in their next pregnancy.

References

1. Durnwald C, Mercer B. Uterine rupture, perioperative and perinatal morbidity after single layer and double layer closure at cesarean delivery. *Am J Obstet Gynecol* 2003; 189: 925-9.
2. Bujold C, Bujoid E, Hamilton EF et al. The impact of single layer or double layer closure on uterine rupture. *Am J Obstet Gynecol* 2002; 186: 1326-30.
3. Cruickshank DP. The impact of single or double layer closure on uterine rupture. *Am J Obstet Gynecol* 2003; 188: 295-6
4. Chapman SJ, Owen J, Hauth JC. One versus two layer closure of a low transverse cesarean; the next pregnancy. *Obstet Gynecol* 1997; 89: 16-8.
5. Tucker JN, Hauth JC, Hodgkins P et al. Trial of labor after a one or two layer closure of a low transverse uterine incision. *Am J Obstet Gynecol* 1993; 168: 545 - 6.
6. Hohlagschwandtner M, Chalubinski K, Nather A et al. Continuous vs interrupted sutures for single layer closure of uterine incision at cesarean section. *Arch Gynecol Obstet* 2003;268: 26-8.
7. Enkin MW, Wilkinson. Single vs two layer suturing for uterine incision. *Cochrane Database. Systemic Review* 2000.

C. N. Purandare