

# Improvements in Cesarean Section Techniques: Arad's Obstetrics Department Experience on Adapting the Vejnovic Cesarean Section Technique

Cristian FURAU<sup>a</sup>; Gheorghe FURAU<sup>a,b</sup>; Voicu DASCAU<sup>a,b</sup>; Gheorghe CIOBANU<sup>a</sup>; Cristina ONEL<sup>a,b</sup>; Casiana STANESCU<sup>a,b</sup>

<sup>a</sup>“Vasile Goldis” Western University, Arad, Romania

<sup>b</sup>Emergency Clinical County Hospital, Arad, Romania

## ABSTRACT

**Objectives:** Cesarean section has become recently the first choice for delivery in many clinics in Romania and worldwide. The purpose of our study is to assess the benefits of introducing the adapted Vejnovic uterine suture technique into daily practice.

**Material and Methods:** A total of 1703 out of the 1776 cesarean section performed in the period January, 2012 - March, 2013 in the Obstetric Department of the Emergency Clinical County Hospital of Arad were retrospectively analyzed based on the cesarean section registries, birth registries and patient's personal medical records. We compared results between the group of patients undergoing adapted Vejnovic cesarean section technique and the group of patients operated in a classic manner.

**Outcomes:** The cesarean section rate in the studied period was 56.48%. Adapted Vejnovic cesarean section technique was performed in 548 cases (30.86% of the cases), furthermore in the last 3 months studied it reached 57.27%. Mean APGAR score was better in the adapted Vejnovic cesarean section group (8.43) compared with the reference group (8.34). No significant differences were seen between the two groups regarding maternal age, gestation, weeks of gestation, newborn weight, anesthesia and indications for cesarean section. Exteriorizing the uterus helped the incidental diagnosis of 35 uterine myoma, 22 adnexal masses and 13 uterine malformations.

**Conclusion:** In a society with a constant growth of cesarean rate, the adapted Vejnovic cesarean section technique is becoming popular amongst clinicians for its advantages, but further studies need to be developed for its standardization.

**Keywords:** cesarean section, uterine suture, delivery, surgical technique

Address for correspondence:

Cristian Furau, Department of Obstetrics from the “Vasile Goldis” Western University of Arad Clujului Street, no 109, Arad, Arad, Romania  
PO: 310057.

E-mail: cristianfurau@gmail.com

Article received on the 3<sup>rd</sup> of June 2013. Article accepted on the 19<sup>th</sup> of August 2013.

## INTRODUCTION

Cesarean delivery, the most common obstetric surgery today, is defined as the birth of the fetus through incision of the abdominal wall and uterine wall. Improvement of operative techniques, anesthesia proficiency, availability of antibiotics and blood products, recognition of the fetus as a patient, the wide acceptance and demand of this procedure by women has contributed to the safety of the procedure and expansion of indications throughout the last century and nowadays. Although its high frequency, there is a wide variation in the surgical techniques used and also in the quality of evidence for supporting the chosen technique (1-7).

In the last few years the technique used for caesarean sections has been simplified, resulting in a lower postoperative morbidity (8). One specific risk factor involved in a post caesarean pregnancy is the fear of scar rupture. Closure of the uterine incision is a key step in cesarean section, particularly given the increasing awareness of future scar dehiscence. It is imperative therefore, that the optimal surgical technique be employed to minimize the morbidity in both the present case and in any future deliveries (9). A Cochrane review (10) of techniques for uterine closure in cesarean section was also published in 2008. It brought out that single-layer closure was associated with significant reductions in blood loss, operative time and postoperative pain. Hamar et al.(11) randomized 30 women to one or two-layer closure and followed them up with ultrasonographic assessment of the scar remodeling at the 2<sup>nd</sup> and 6<sup>th</sup> week after surgery. They reported equivalent scar thickness irrespective of the method of closure. However, if a technique can combine the short-term advantages of single layer and can provide perceived long-term strength to the uterine scar provided by a double layer technique, it would become an ideal suturing technique for uterine closure. Given that the operation is conducted so frequently, any attempt to reduce risks associated with it (even with relatively modest alteration in the surgical procedure for a particular outcome) is likely to yield significant benefits in terms of costs and better health outcomes for women (12-15).

Despite evidence from randomized clinical trials, many obstetricians continue to use in

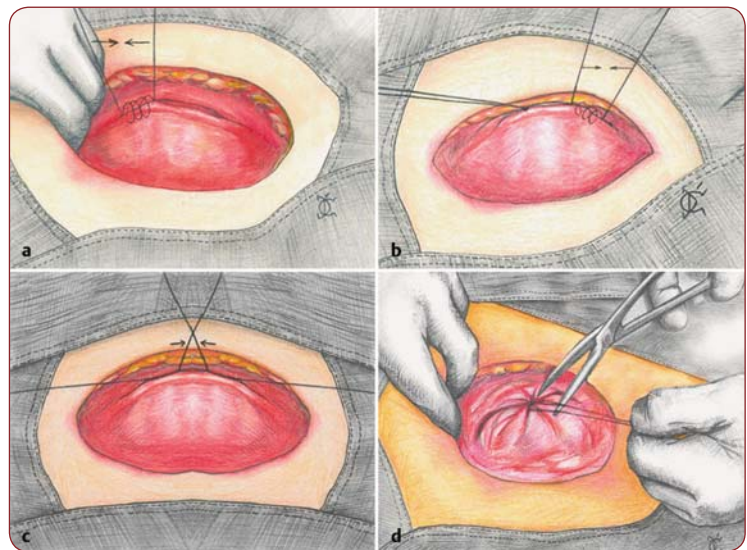
daily practice the techniques they have learned during their specialization, techniques that might increase morbidity (1).

Vejnovic's modification to cesarean section technique concerns first of all the suture of the uterus, as seen in picture 1 reproduced with accord from the author (9). Our clinic's main adaptation of the technique consists in: exteriorizing the uterus for the suture with subsequent better inspection of the pelvic organs and the control of uterine cavity after placenta removal (both manual and instrumental). We mention that our technique is according to Romanian protocols (4) and it takes into consideration Cochrane reviews and analysis (5-24).

Our study aims to present and discuss the benefits brought by our clinic's adaptation of the Vejnovic cesarean section modified technique and the reasons for its increased popularity amongst the clinicians during a short timeframe. □

## MATERIAL AND METHODS

A cohort retrospective study was designed, which comprised the 1776 patients that delivered through cesarean section out of the total of 3201 deliveries registered in the Obstetrics Department of the Emergency Clinical



**FIGURE 1.** Uterine suture technique. The uterus is closed by 2 sutures starting from either end of the wound. a The first suture stitch is placed slightly medially from the anatomical corner of the wound. The same suture thread is used to make 2-4 more continuous sutures and the ends of the suture thread are knotted. b Analogously a second suture thread is used to close the uterine wall starting from the other side. c Both sutures are knotted in the middle and d subsequently the suture is buried by knotting the suture threads (from (9)).

County Hospital of Arad in the period 1.01.2012-31.03.2013, using data obtained from operative protocols registries, birth registries and patient's personal medical records. We used Student's t-test and EPI INFO 7 for statistical analysis.

Two groups of patients were defined: a group of 520 patients that delivered through adapted Vejnovic cesarean section technique and a control group of 1183 patients delivered through classic cesarean section techniques (Doerfler, Pfannestiel, Misgav-Ladach). We compared this two groups following: age of patients, weeks of gestation, indication for cesarean section, anesthesia, intra operative events, new-born weight and APGAR score.

Exclusion criteria were: patients below 35 weeks of gestations (52 cases) and multiple pregnancies (21 cases). Out of these cases modified Vejnovic technique was applied to 28 cases, while for other 45 cases a classic technique was used. □

### OUTCOMES

During January, 2012 - March, 2013, 3201 deliveries were registered, 1776 of them through cesarean section (55.48%). A slight increase of the cesarean section rate is seen between first and second semester of 2012 (54.08% vs. 54.86%), followed by a more significant one in the first trimester of 2013 (60.03%). Subsequently we confirm a birth rate decrease, which is part of last years' tendencies.

Following the introduction in clinical practice of the adapted Vejnovic cesarean section technique in May 2012 (after being coursed in Novi Sad by Professor Tihomir Vejnovic), we observed after the initial reluctance to the technique, a growing interest, followed by a majority acceptance. Numbers confirm these statements: 49/ 642 patients (7.63%) in the first semester of 2012, 302/ 750 cases (40.27%) in

the second semester of 2012 and 197/ 344 cases (57.27%) in the first trimester of 2013.

Comparing data regarding maternal age, gestation, weeks of gestation we haven't found statistically significant differences as seen in Table 1. The small difference between maternal ages reflects no bias due to this cause in the selection of patients. Regarding the p value of 0.0102 detected for parity, we considered it to be a biased one, not showing a real difference between the studied groups.

The outcomes for the newborns have no significant differences regarding weight and APGAR score at 5 minutes (Table 1). By excluding pregnancies of less than 35 weeks of gestation and multiple pregnancies, mean weight is artificially risen in both groups (not significantly though), but taking into consideration this fact and the time of performing cesarean section, we demonstrate that there were merely identical conditions for both types of surgical techniques.

APGAR score higher than 6 at five minutes in both groups (95% in the Vejnovic group and 94.14% in the reference group) shows that indication for cesarean section was made before a severe installation of a fetal distress and also reflects a better accommodation of the newborn to exterior conditions in the adapted Vejnovic group, though not making a significant statistical difference ( $p=0.1725$ ).

The high rate of cesarean section and the indications hide the cesarean made on patient's request. Most frequent indications for cesarean sections are: previous cesarean section, cephalic-pelvic disproportion and fetal distress, abnormal presentation, placental disorders and dystocia, as shown in Figure 2. We can't make any supported scientific observation between the two groups on this criterion, as multiple sources of bias were detected, but we can remark the increasing rate of previous cesarean section and fetal distress.

Parameter	Adapted Vejnovic group				Reference Group				p value
	Mean	Std Dev	Min	Max	Mean	Std Dev	Min	Max	
Maternal age (years)	26.34	6.16	14	43	26.73	5.95	13	43	0.2180
Gestation	1.98	2.25	1	39	2.16	1.81	1	14	0.0803
Parity	1.56	0.99	1	10	1.72	1.26	1	12	0.0103
Weeks of gestation	38.48	1.26	35	43	38.49	1.64	35	42	0.9014
Newborn weight (g)	3250.48	440.36	1700	4900	3231.12	474.06	1700	5200	0.9997
APGAR score	8.43	1.14	1	10	8.34	1.30	0	10	0.1725

TABLE 1. Maternal age, gestation, parity, weeks of gestation in the two studied groups of cesarean sectioned patients. The adapted Vejnovic group had 520 patients included and the reference group 1183 patients.

Spinal anesthesia was used in 89.62% for the Vejnovic group, while for the reference it was used in 84.52% of the cases.

The number of intra operative complications is hard to assess without having a proper standard formulary. We found a total of 45 uterine hypotonia and atonia (8 in the Vejnovic group) with the need for hysterectomy in 6 cases (1 in the Vejnovic group). A compromised uterine tranche was found in 16 cases (4 in the Vejnovic group) reflecting the evolution of previous cesarean section all done with classic techniques. Vejnovic suture could be performed in all these cases with good results. No previous Vejnovic cesarean section had a second cesarean during the study, so that we can make statements about the quality of the scar.

The exteriorization of the uterus performed in both techniques plays an important role in diagnosis of incidental adnexal mass and uterine malformations. We detected 22 adnexal masses (4 in the Vejnovic group), 10 of them being removed in the same surgical intervention (3 in the Vejnovic group). 13 uterine malformations were found (6 in the Vejnovic group) and 35 cases of myoma (15 in the Vejnovic group).

Adapted Vejnovic cesarean section technique started to replace the classic techniques for cesarean section for a multitude of reasons, like: reduced blood loss, good haemostasis for the uterus, minimal invasive technique ending in better patient recovery, short operative time, reduced number of surgical instruments and suturing materials, less intra operative and post operative complications. Our present study has insufficient data to prove all mentioned above, but from our clinical experience with the adapted Vejnovic technique we are sure that the support for our statements will soon be available. □

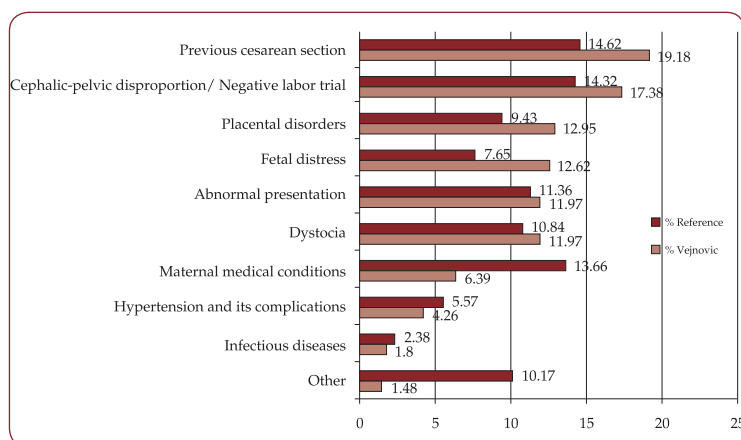


FIGURE 2. Indications for cesarean section, in percentages, for both studied groups.

## CONCLUSIONS

Adapted Vejnovic cesarean section technique has important advantages for the patient, doctor and hospital.

Doctors from our clinic switched to Vejnovic technique short time after its presentation, considering it superior to previous ones.

Exteriorizing uterus during cesarean section offers better diagnosis and management options for adnexal masses.

Further studies need to be developed for the standardization of this technique and evaluation of the subsequent uterine scar.

The differences between the original Vejnovic technique and its adaptation need to be analyzed in larger and standardized multicentric studies.

*Conflict of interests: none to declare.*

*Financial support: none to declare.*

*Acknowledgements: The authors would like to thank Professor Tihomir Vejnovic and Diezfa-lusy Foundation for their support and commitment to medical progress.*

## REFERENCES

- Dickinson JE – Cesarean Section. In: James DK, Steer PJ, Weiner CP, et al. High risk pregnancy: Management options, 3rd Edition. Philadelphia, Elsevier Saunders, 2006: 1543-1556
- Cunningham FG, Leveno KJ, Bloom SL, et al. – Williams Obstetrics, 23rd Edition, New York, McGraw-Hill Medical, 2010: 544-576
- Vejnovic TR – Cesarean delivery–Vejnovic modification. *Srp Arh Celok Lek.* 2008 May;136 Suppl 2:109-15
- Nanu D, Sucu R – Operatia cezariana. In: Ghiduri Clinice pentru Obstetrica si Ginecologie; Tiparit la R A Monitorul Oficial, Bucuresti, Oscar Print, 2011; ISBN 978-973-668-278-0
- Foradada Morillo C, Costa Canals L – Caesarean Section. In: Carrera JM, Carbonell X, Fabre E. Recommendations and guidelines for perinatal medicine. Barcelona, Matres Mundi, 2007: 272-282
- Depp R – Cesarean Delivery. In: Gabbe SG, Niebyl JR, Simpson JL. Obstetrics: Normal and Problem Pregnancies, Fourth Edition. Philadelphia, Churchill Livingstone, 2002: 539-606
- Munteanu I – Operatia cezariana. In: Munteanu I. *Tratat de Obstetrica*, Editia

- a II-a. Bucuresti, Editura Academiei Romane, 2006: 591-622
8. **Khunpradit S, Tavender E, Lumbiganon P, et al.** – Non-clinical interventions for reducing unnecessary caesarean section. *Cochrane Database of Systematic Reviews* 2011, Issue 6. Art. No.: CD005528. DOI: 10.1002/14651858.CD005528.pub2.
  9. **Vejnovic TR, Costa SD, Ignatov A** – New Technique for Caesarean Section. Die Entwicklung einer modifizierten Technik für eine Sectio caesarea. *Geburtsh Frauenheilk* 2012; 72:840-845
  10. **Dodd JM, Anderson ER, Gates S** – Surgical techniques for uterine incision and uterine closure at the time of caesarean section. *Cochrane Database Syst Rev.* 2008 Jul 16;(3)
  11. **Hamar BD, Saber SB, Cackovic M, et al.** – Ultrasound evaluation of the uterine scar after caesarean delivery: A randomized controlled trial of one- and two layer closure. *Obstet Gynecol.* 2007;110:808-13
  12. **Abalos E** – Surgical techniques for caesarean section: RHL commentary (last revised: 1 May 2009). The WHO Reproductive Health Library; Geneva: World Health Organization
  13. **Hofmeyr GJ, Mathai M, Shah AN, et al.** – Techniques for caesarean section. *Cochrane Database of Systematic Reviews* 2008, Issue 1. Art. No.: CD004662. DOI: 10.1002/14651858.CD004662.pub2
  14. **Mathai M, Hofmeyr GJ** – Abdominal surgical incisions for caesarean section. *Cochrane Database of Systematic Reviews* 2007, Issue 1. Art. No.: CD004453. DOI: 10.1002/14651858.CD004453.pub2
  15. **Dahlke JD, Mendez-Figueroa H, Rouse DJ, et al.** – Evidence-based surgery for caesarean delivery: an updated systematic review. *American Journal of Obstetrics & Gynecology* - 04 March 2013 (10.1016/j.ajog.2013.02.043)
  16. **Mirjana Varjadic M, Babic G, Loncar D** – The Increased Caesarean Section Incidence - Is There a Clinical Justification?. *Macedonian Journal of Medical Sciences.* 2011 Sep 30; 4(3):281-284
  17. **Vejnovic T, Grahovac M, Veselovski A, et al.** – Surgical wounds complications in two different techniques of a cesarian section. *Health Med* 2011, Vol. 5 Issue 6, p1754
  18. **Dyson RD** – Caesarean Delivery: Surgical Techniques – The Fifteen Minute Caesarean Section. In: Salim R (Ed). *Cesarean Delivery.* 2012 InTech Europe 57-68 ISBN: 978-953-51-0638-8
  19. **Lavender T, Hofmeyr GJ, Neilson JP, et al.** – Caesarean section for non-medical reasons at term (Review). *Cochrane Database Syst Rev.* 2012 Mar 14;3
  20. **Jacobs-Jokhan D, Hofmeyr GJ** – Extra-abdominal versus intra-abdominal repair of the uterine incision at caesarean section (Review). *Cochrane Database Syst Rev.* 2004 Oct 18;(4)
  21. **Babu KM, Navneet Magon** – Uterine Closure in Caesarean Delivery: A New Technique. *N Am J Med Sci.* 2012 August; 4(8): 358-361
  22. **Bujold E** – The optimal uterine closure technique during caesarean section. *N Am J Med Sci.* 2012 August; 4(8): 362-363
  23. **Teguete I, Sissoko A, Djire MY, et al.** – Determining factors of caesarean delivery. Trends in developing countries: Lessons from Point G National Hospital (Bamako- Mali) In: Salim R (Ed). *Cesarean Delivery.* 2012 InTech Europe: 161-200; ISBN: 978-953-51-0638-8
  24. **Socol ML** – The influence of practice management on primary caesarean birth. *Semin Perinatol.* 2012 Oct; 36(5):399-402.

