

## Original Research Article

# A Study of the Maternal Outcome in Pregnancies Following Cervical Cerclage in a Tertiary Care Hospital

Dr. Gujju Raja Lakshmi<sup>1</sup>, Dr. Eeshita Badiya<sup>2</sup>, Dr. Tanista badiya<sup>3</sup>

<sup>1</sup>Associate professor, Department of Obstetrics and Gynaecology, Andhra Medical College, Visakhapatnam, Andhra Pradesh, India.

<sup>2</sup>Postgraduate, Department of Obstetrics & Gynaecology, Seth GS Medical College, Mumbai, Maharashtra, India

<sup>3</sup>MBBS Graduate, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry, India.

### Corresponding Author

Dr. Gujju Raja Lakshmi, Associate professor, Department of Obstetrics and Gynaecology, Andhra Medical College, Visakhapatnam, Andhra Pradesh, India.

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## ABSTRACT

### Background and Objective

Cervical incompetence is found to be an important cause of mid-trimester pregnancy losses and preterm delivery. However, measurement of cervical length and diagnosis of short cervix by ultrasonography and timely application of cervical cerclage can carry these pregnancies to term and eventually lead to a successful outcome.

### Methods

The present retrospective observational study included 50 pregnant women diagnosed with cervical incompetence. Mc Donald's cervical cerclage was placed and its effectiveness was considered by successful pregnancy outcome.

### Results

Out of the 50 patients recruited into the study 41 (82%) patients had successful pregnancy outcome with delivery at term and 6 (12%) patients had preterm delivery. This shows that timely diagnosis and placement of cervical cerclage is effective and leads to successful pregnancy outcome especially in those with history of mid-trimester pregnancy losses and preterm delivery.

### Conclusion

The timely placement of cervical cerclage results in successful pregnancy outcome especially in those patients with history of mid-trimester miscarriages.

**Keywords:** Cervical incompetence, mid-trimester miscarriage, cervical cerclage, pregnancy outcome.

## INTRODUCTION

Cervical incompetence is defined as the inability of the cervix to maintain or support a pregnancy to term because of structural and functional defect.<sup>(1,2)</sup> It is an important cause of recurrent mid-trimester pregnancy losses and preterm delivery. Cervical insufficiency or incompetence is a clinical diagnosis with history of painless cervical dilatation leading to miscarriage. It may be congenital or acquired. The incidence of having cervical insufficiency is estimated to be less than 1% of obstetric population.<sup>(3)</sup> Majority are acquired following complicated deliveries, termination of pregnancy, cone biopsy, cervical amputation, torn cervix, loop surgical excision. The congenital causes are in utero diethylstilbesterol exposure, collagen vascular disorders and uterine anomalies.<sup>(4)</sup> Cervical incompetence presents classically in the second or third trimester with drainage of amniotic fluid, rapid painless cervical effacement and dilatation with eventual expulsion of the products of conception. The measurement of cervical length by transvaginal ultrasound is now commonly used to assess the cervical length to diagnose pregnant women with cervical incompetence and risk of preterm delivery.

This is a retrospective observational study where women diagnosed to be having cervical incompetence by transvaginal ultrasound had a transvaginal cervical cerclage performed as the treatment modality.

Pregnant women with prior history of repeated second trimester losses and preterm delivery were taken as potential candidates for placement of cervical cerclage at 12 to 14 weeks of gestation to avoid spontaneous loss.

Pregnant women with a single term pregnancy, prior preterm delivery and a short cervix where the cervical length on transvaginal ultrasound examination at 16 to 25 weeks was less than 25mm were taken as potential candidates of ultrasound indicated cervical cerclage.<sup>(5)</sup>

Pregnant women with cervical incompetence before 12 weeks of gestation did not have cerclage performed because most of the miscarriages are due to aneuploidy and occur in early and mid-trimester.

The cervical cerclage is removed electively at 37 weeks of gestation or immediately upon onset of labour.<sup>(6)</sup>

The incidence of preterm delivery before 34 weeks is halved by cervical cerclage among women with history of three or more preterm deliveries before 37 weeks as was shown in one trial.

The cerclage in all the cases was placed through a transvaginal approach. The commonly used techniques for transvaginal cervical cerclage are those used by Shirodkar and Mc Donald.

Mc Donald described a suture technique placed in the form of a purse string that did not require any cervical dissection and that was easily placed during pregnancy. Because of it being very effective apart from its simplicity and ease of application Mc Donald's technique of cerclage was used for all cases recruited in this study.

## AIMS AND OBJECTIVES

The objective of this study is to diagnose pregnant women with cervical incompetence and to study the outcome of these pregnancies following cervical cerclage.

## MATERIALS AND METHODS

The present retrospective observational study included 50 pregnant women diagnosed with cervical incompetence admitted into the department of obstetrics and gynaecology at King George Hospital, which is a tertiary care hospital in Visakhapatnam between March 2023 to March 2024. Methodology included taking a detailed history, clinical examination, ultrasound examination(both transvaginal and transabdominal), management, follow up and outcome.

### Inclusion Criteria

1. Patients who had previous two or more mid-trimester miscarriages
2. Patients with previous history of cerclage
3. Patients with previous preterm delivery
4. Patients with multiple pregnancy
5. Patients with any history of trauma or surgery to the cervix

### Exclusion Criteria

1. Patients with medical disorders like diabetes mellitus, chronic hypertension
2. Patients with advanced cervical dilatation and rupture of membranes
3. Patients diagnosed with fetal anomalies

### Statistical Analysis

Data obtained was interpreted as percentage.

## RESULTS

**Table 1: Distribution of study subjects based on age**

Age(years)	No of cases n=50	Percentage(%)
< 20 years	06	12 %
21-25 years	30	60 %
26-30 years	10	20 %
> 30 years	04	8 %

The maximum number of patients were in the age group of 21-25 years which was 60% whereas 8% of the patients were in the age group above 30 years.

**Table 2: Distribution of study subjects based on parity**

Parity	No of cases n=50	Percentage(%)
Primi	12	24 %
2 <sup>nd</sup> Gravida	18	36 %
3 <sup>rd</sup> Gravida or more	20	40 %

Patients who were gravida three or more comprised 40% while 36% were gravida two and 24% were primigravida.

**Table 3: Distribution of study subjects based on obstetric history**

Previous History	No of cases (n=50)	Percentage(%)
Mid-trimester miscarriage	18	36%
Preterm Labor	15	30%
Short Cervix	10	20%
Multiple Pregnancy	03	06%
Previous history of cerclage	04	08%

The maximum number of patients who were considered for cerclage which is 36% were those who had previous mid-trimester miscarriage, followed by 30% who had preterm labor in their previous pregnancy. The rest of the patients who were considered for cerclage were those with previous history of short cervix 20%, previous multiple pregnancy 06% and 08% patients with previous history of cerclage.

**Table 4: Distribution of study subjects based on indication and gestational age at which cerclage was applied**

Indication for cerclage	Gestational age		
	12-14 weeks	15-20 weeks	>20 weeks
Previous history of mid-trimester abortion	12	4	2
Preterm labour	8	7	0
Short cervix	6	4	0
Multiple pregnancy	0	3	0
Previous history of cerclage	4	0	0

12 patients with previous history of mid-trimester abortion subjects had cerclage between 12-14 weeks and 4 patients at 15-20 weeks. With previous preterm labor 8 patients had cerclage at 12-14 weeks and 7 patients at 15-20 weeks. With previous history of short cervix 6 patients had cerclage at 12-14 weeks and 4 patients at 15-20 weeks. For previous history of multiple pregnancy 3 patients had cerclage applied at 15-20 weeks. 4 patients with previous history of cerclage had repeat cerclage at 12-14 weeks of pregnancy.

**Table 5 : Distribution of cases according to pregnancy outcome and mode of delivery**

Gestational age at cerclage application	Number of cases	Outcome		
		Abortion	Preterm	Term
< 14 weeks	10	1	1	8
15-20 weeks	28	1	2	25
>20 weeks	12	1	3	8

Patients who had cerclage applied at <14 weeks who were ten in number, 8 had term delivery. Of 28 patients who had cerclage applied between 15-20 weeks 25 had term delivery. Out of 12 patients who had cerclage at > 20 weeks, 8 had term delivery.

**Table 6 : Distribution of cases according to pregnancy outcome and mode of delivery**

Pregnancy outcome		Mode of delivery	
		Vaginal delivery	Caesarean Section
Term	41	31	10
Preterm	6	06	0
Miscarriage	3	0	0

Out of 45 patients who had term deliveries, mode of delivery was vaginal in 31 patients while 10 patients had caesarean section. 6 patients had preterm vaginal delivery. The number of patients who had miscarriage were 3 in number.

## DISCUSSION

Cervical integrity is an important factor in determining the outcome of pregnancy as its inability to retain the product of conception will lead to a loss of pregnancy and thus result in an adverse pregnancy outcome. The maximum number of cerclages carried out in this study were in the age group between 21-25 years with mean age of 27 years. The various maternal ages (mean) quoted by other authors include- median age of women in the study was 27.0 years (mean 27.2 [SD 4.3] years, range 19–40 years) by Gundabattula et al<sup>(7)</sup> median maternal age was 32 years (range 18±48 years) in the retrospective study by J R Cook et al, mean age of 31 years in the elective cerclage group in the study by Liddiard et al<sup>(8)</sup> and a mean age of 27.7 years in the MRC/RCOG study group.<sup>(9)</sup>

It is important to identify patients with a history of late miscarriages to prevent recurrent pregnancy losses in patients with the potential diagnosis of an incompetent cervix (Romero et al., 2006; Simcox et al., 2007).<sup>(10,11)</sup> This was confirmed by our observations of a correlation between the indication of a cervical cerclage and the history of second trimester miscarriage

Mean gestational age at time of cerclage was found to be  $16 \pm 4$  weeks in our study group. In the study, early cerclage is found to be a positive factor influencing success of cervical cerclages. However, none of the earlier studies have reported the benefit of early cerclages over late cerclages (>20 weeks) (ACOG Practice Bulletin. Cervical insufficiency, 2003; MRC/RCOG Working Party on Cervical Cerclage, 1993), despite the fact that most studies show better results for early cerclage (ACOG Practice Bulletin. Cervical insufficiency, 2003; Liddiard et al., 2011; Kurup and Goldkrand, 1999; Wu et al., 1996).<sup>(8,9,12,13,14)</sup>

Transvaginal ultrasonography done early can be helpful to detect short cervix (around 14–16 weeks of gestational age) for patients with a high-risk of late miscarriage or preterm birth, can be useful to identify those with short cervix to enable early intervention and thus prevent loss of pregnancy and increased chances of survival of the fetus.

The median gestational age at which a suture was inserted in the cerclage group was 15.9 weeks in the study conducted by MRC/RCOG working party group. In the study by Liddiard et al gestational age at cerclage was reported as 14 (6–19) weeks. In a study by Althuisius et al cerclages were inserted between 14-27 weeks .Rush et al and Gundabattula et

al reported gestational age at time of cerclage to be between 15-21 weeks and 21.9 weeks respectively.<sup>(7,8,9,15)</sup>

In the present study 41 (82%) patients delivered at term .This is almost similar to the study conducted by MRC/RCOG working party on cervical cerclage, where there were fewer deliveries before 33 weeks in the cerclage group. The term delivery rate in this study is also similar to the study by Abiodun et al which was 76.5%. This is also similar to 68.8% in the study by Ikimalo et al<sup>(16)</sup> 65.3% Idrisa et al<sup>(17)</sup>. This study supported previous reports of improved outcome of pregnancies following cerclage. Thus, this study suggests the usefulness of cervical cerclage in women with previous history of second trimester losses or preterm delivery in selected patients similar to the conclusion of Mancuso et al<sup>(18)</sup> that cervical cerclage may be useful in women with prior early preterm delivery and who have shortened mid-trimester cervical length. Hence this shows that cervical cerclage has better pregnancy salvage rates.

## CONCLUSION

The outcome of the present study indicates the usefulness and effectiveness of cervical cerclage in the management of pregnancy by prolongation of pregnancy and thereby improving the outcome especially in patients with incompetence of the cervix due to previous history of mid-trimester losses and preterm delivery. Hence this procedure can be advised for these women.

## REFERENCES

1. Harger J H. Cervical cerclage. Patients' selection, Morbidity and success rates. Clin Perinatol 1983;10:321.
2. Bennett P Preterm Labour. In: Edwards DK [Ed]. Dewhurst's Textbook of Obstetrics and Gynaecology. 7<sup>th</sup> ed. London: Blackwell Publishing; 2007.p.184-185.
3. Suhag A, Seligman NS, Binachi I, Berghella V, What is Oimal gestational age for History Indicated cerclage Placement? AM Journal of perinatal 2010;27(6);469-474.
4. Ezechi OC, Kalu BKE, Nwokoro CA. Prophylactic cerclage for the prevention of preterm delivery. Int J Gynecol Obstet 2004;85:283-284.
5. Berghella V, Odibo AO, To MS,et al. Cerclage for short cervix on ultrasonography: meta-analysis of trials using individual patient-level data. Obstet Gynecol 2005;106:181-9.
6. International Journal of Reproduction, Contraception, Obstetrics and Gynecology Prasad NN et al. Int J Reprod Contracept Obstet Gynecol. 2017 May;6(5):1993-1998 106:181
7. Gundabattula SR, Marakani LR, Dasari S, Surampudi K, Pochiraju M, Nirmalan PK. Outcomes of pregnancy in women who had rescue cerclage for cervical insufficiency: a single-center retrospective study. *J Obstet Gynaecol Res.* 2013;39(8):1293–300.
8. Liddiard A, Bhattacharya S, Crichton L. Elective and emergency cervical cerclage and immediate pregnancy outcomes: a retrospective observational study. *SM Short Rep.* 2011;2(11):91.

9. Final report of the Medical Research Council/Royal College of Obstetricians and Gynaecologists multicentre randomised trial of cervical cerclage. MRC/RCOG Working Party on Cervical Cerclage. *Br J Obstet Gynecol* 1993;100(6):516-23
10. Romero R, Espinoza J, Erez O. The role of cervical cerclage in obstetric practice: can the patient who could benefit from this procedure be identified? *Am J Obstet Gynecol*. 2006;194:1–9.
11. Simcox R, Shennan A. Cervical cerclage in the prevention of preterm birth. *Best Pract Res Clin Obstet Gynaecol*. 2007;21(5):831–4
12. American College of Obstetricians and Gynecologists. Cervical insufficiency. *Obstet Gynecol*. 2003;102:1091–9.
13. Peters MA, Thiagarajah S, Harbert GM. Cervical cerclage: Twenty years' experience. *South Med J*. 1979;72(8):933–7.
14. Wu MY, Yang YS, Huang SC, Lee TY, Ho HN. Emergent and elective cervical cerclage for cervical incompetence. *Int J Gynaecol Obstet*. 1996;54(1):23–9.
15. Althuisius SM, Dekker GA, Hummel P, Bekedam DJ, vanGeijn P. Final results of the Cervical Incompetence Prevention Randomized Cerclage Trial (CIPRACT): therapeutic cerclage with bed rest versus bed rest alone. *Am J Obstet Gynecol*. 2001;185(5):1106–12.
16. Ikimalo JI, Izuchukwu KE, Inimagba N. Pregnancy outcome after cerclage for cervical incompetence at the University of Port Harcourt Teaching Hospital, Port Harcourt. *Afr J Reprod Health* 2012; 16[3]:180-184
17. Idrisa A, Kyari O, Ojiyi E. Pregnancy complications and outcome following cervical cerclage at University of Maiduguri, Nigeria. *Nig J Clin Pract* 2002;5[1]25-28s
18. Mancuso MS, Owen J. Prevention of preterm birth based on a short cervix: cerclage. *Semin Perinatol* 2009;33[5]:325-333.