

SURGICAL TREATMENT OF INCOMPETENT CERVIX DURING PREGNANCY BY SAITO MODIFICATION OF SHIRODKAR OPERATION

BY

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ABSTRACT

The Shirodkar operation for the treatment of cervical incompetency during pregnancy was modified by Motoi Saito of our department and has been adopted since 1974. This paper describes the operative techniques of the procedure and reviews the results of 34 cases treated by the modification during the last 10 years. The rate of success was 76.5% for the post-operative delivery after completing 37 weeks of gestation, and, if the 17.6% of the viable premature births were included, the fetal salvage rate by the procedure was 94.1%. The Saito modification procedure provides easy identification of the cervical cerclage ligature and facilitates the complete removal of the suture before or during labor. The 10-year results suggest that the procedure was as effective as the original Shirodkar operation for the prevention of premature birth and fetal loss due to incompetent cervix during pregnancy.

Key words: Cervical incompetence, Cerclage suture, Saito Modification, Fetal salvage rate.

INTRODUCTION

Cervical incompetence is any condition of the uterine cervix that permits sufficient painless dilatation to allow a spontaneous rupture of the membrane and subsequent onset of labor before the term and resulting in fetal loss. Shirodkar realizing that the defect in the internal os of the cervix could be treated and described a method of encirclement by means of a fascial strip in 1955⁽¹⁾. The effectiveness of the Shirodkar procedure was validated and many modifications of the procedure were also reported in the following decade⁽²⁻¹⁰⁾.

This study describes the Saito modification of the Shirodkar procedure and reviews the 10-year results. From our previous experience, we feel that several

post-operative complications of the procedure must be addressed and improved. In the past, we had frequently encountered difficulty in removing the suture before and during labor. In many cases, the sutures were either partially or completely buried under the cervical mucosa resulting in incomplete removal of the suture. Since Saito modified the procedure in 1974, we no longer have the problem in removing the suture either before or during labor.

MATERIALS AND METHODS

This study was based on the records of 34 cases of cervical incompetence during pregnancy treated by the Saito modification from 1974 through 1983, a period of 10 years. The criteria for inclusion in this series were (1) past history of repeated

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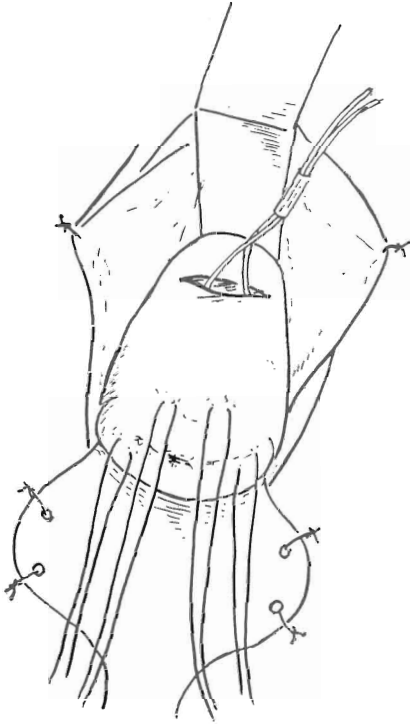


Fig. 1. Addition of a polyethylene tube to the ligature before tightening.

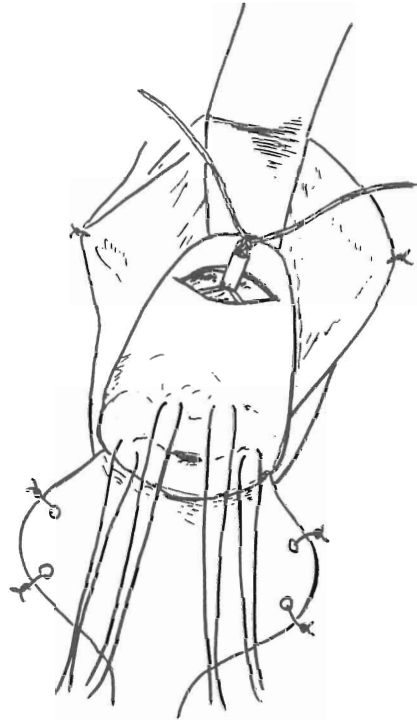


Fig. 2. Tightening of the ligature on top of the tube in the center of the anterior cervical mucosa.

mid-term abortions (8 cases, 23.5%), (2) past history and clinical finding of cervical dilatation in current pregnancy (10 cases, 29.4%) and (3) clinical finding of cervical dilatation in current pregnancy (16 cases, 47.1%). There were 4 cases of repeated Shirodkar operation. Three of the women were primigravidas, the other patients having a total of 26 surviving infants in 71 pregnancies, and the pre-operative fetal salvage rate was 36.6%. The median age was 29 years, the youngest being 25 and the oldest 38 years. The average duration of pregnancy at the time of operation was 20.6 weeks.

Procedures of the Saito Modification

(1) Operative techniques

The patient under spinal anesthesia is placed in a steep Trendelenburg position and the operative field is prepared in the

usual manner. Six stay sutures are first placed at 11, 1, 3, 5, 7 and 9 O'clock position of the cervix for traction during the operation. Transverse incisions of the anterior and posterior walls of the cervix, separation of the bladder and rectal wall and the introduction of the cerclage ligature are first performed according to the method described by Shirodkar ⁽¹⁾. The Saito modification is then applied before the tightening of the encircling ligature. A hollow polyethylene tube of about 2.5 cm long, which has a diameter large enough to allow the two ends of the cerclage suture (nylon string) to pass through together, is added to the ligature before tightening (Fig. 1). The nylon tube which contains the two ends of the ligature is placed in the center of the anterior cervical surface in an erect position and multiple knots are then

tied on top of the tube (Fig. 2). The tube which serves as a cushion or mattress for the ligature knots is seen with 1 cm of it exposing the outside of the repaired cervical mucosa in the anterior fornix after the operation (Fig. 3).

(2) Post-operative management

An indwelling Foley catheter is placed for 24 hours and the patient is routinely

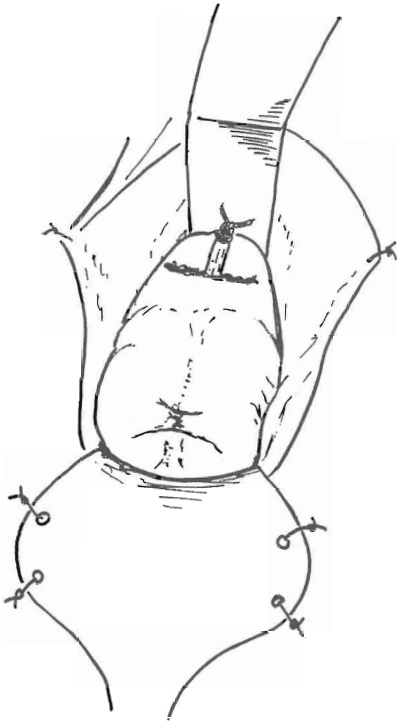


Fig. 3. The Saito modification ligature after the operation.

given prophylactic antibiotics together with myometrial suppressants for the first 72 hours after the operation. If no complications are detected, the patient is discharged on the 7th day and followed in the outpatient clinic every fortnightly.

(3) Removal of the ligature

The ligature is routinely removed after the completion of 38 weeks of gestation if no premature onset of labor occurs. To remove the ligature, the polyethylene tube which can be easily identified is grasped and pulled upward to expose the two ends of the cerclage ligature on the cervical mucosa; one of them is excised and then the entire ligature is pulled out from the cervix.

(4) Bacterial culture of removed nylon tube and ligature string

The ligature string and the additional nylon tube which were removed in 4 cases were sent for bacterial culture to assess the risk of infection by the Saito modification. The materials were divided into two parts, one containing the tube and ligature string exposed in the vagina and the other the ligature string buried under the cervical mucosa. The vaginal discharge was also cultured at the same time. The materials were cultured in 5% sheep blood agar and Brom-Thymol Blue (BTB) agar at 37°C for 24 hours and then the bacterial colonies were identified.

Table I. Post-operative Results of Saito Modification

Outcome	Patients (n=34)	Percent
Living term delivery (37-41 weeks)	26	76.5%
Viable Premature delivery (24-36 weeks)	6	17.6%
Abortion	2	5.9%
Total	34	100.0%

Table II. Results of Bacterial Culture of Removed Tube and Ligature

	Case 1			Case 2			Case 3			Case 4		
	V	C	S	V	C	S	V	C	S	V	C	S
C. albicans							++	+	-	++	+	-
GPR	++	++	++				+	-	-	++	+	+
Anae. gram-positive cocci							++	++	++	++	+	+
S. faecalis	+	+	-				+	+	+			
K. pneumoniae				+	+	+						
B. streptoc.	+	+	-									
E. coli				++	++	+						
Torulopsis				+	+	-						

V=Vaginal discharge.

C=Tube and ligature exposed outside the cervix.

S=Ligature buried in the cervical mucosa.

+ =Bacterial colonies were $10^5/ml$.

++ =Bacterial colonies were $10^6/ml$.

+++ =Bacterial colonies were $10^7/ml$.

RESULTS

The rate of success by the modification based on the post-operative delivery after completing 37 weeks of gestation was 76.5% and there were 6 cases of viable premature birth (17.6%). The fetal salvage rate was 94.1% (Table I).

Four cases (11.8%) were delivered by cesarean section due to obstetrical indications. No significant differences in the time required and total blood loss during spontaneous vaginal delivery were found. No maternal death or morbidity during or after the modification procedure was observed and also there was no major abnormality of the newborn in this series.

The results of bacterial culture of the removed tube and ligature as shown in Table II did not indicate any significant increase of the bacterial colonies in the tube and ligature as compared with the vaginal discharge. Clinically, there were no significant findings of cervical inflammation during the pregnancy in the patients.

DISCUSSION

We previously reported in a Japanese medical journal ⁽¹¹⁾ that during the years from 1960 through 1983, there were 211 cases of cervical incompetence during pregnancy which were treated with the standard Shirodkar procedure in our department of obstetrics and gynecology. The rate of success based on the post-operative delivery after completing 37 weeks of gestation was 78.0%, and the fetal salvage rate which included the viable premature birth was 90.5%. The results obtained by the Saito modification in this series showed that it was as effective as the original Shirodkar procedure. The modification provides easy identification and facilitates the complete removal of the cerclage ligature during or before the onset of labor. Also, the extra nylon tube used did not increase the risk of post-operative infection as proven by the bacterial culture of the materials after removal. So, the modification procedure is simple and easily

applicable and is recommended for surgical repair of the incompetent cervix during pregnancy.

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