Review Article

Comprehensive understanding of cervical incompetence with feasible various treatment modalities: Conservative and surgical – A review article

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Abstract

Cervical incompetence is a medical condition in which a pregnant woman's cervix begins to dilate before her pregnancy has reached term. It is the inability of the uterine cervix to retain a pregnancy in the absence of the signs and symptoms of clinical contractions, or labor, or both in the second trimester. Cervical incompetence may cause miscarriage or preterm birth during the second and third trimesters. Cervical incompetence is treated when it appears to threaten a pregnancy. Cervical incompetence can be treated using cervical cerclage, a surgical technique that reinforces the cervical muscle by placing sutures above the opening of the cervix. This study regarding management of cervical incompetence based on routine feasible treatment modalities was carried out in Noor Hospital, IIMS & R, Warudi, Tq. Badnapur, Dist. Jalna.

Key words: cervical incompetence, dysfunctional cervix, circlage.

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INTRODUCTION

A competent cervix is considered to hold the pregnancy till the onset of process of expulsion of conceptus. In this context an incompetent cervix allows premature expulsion of products of conception even when other factors for continuation of pregnancy are favourable. A competent cervix is closed, structurally normal and an incompetent cervix is open, structurally deficient.[1] For understanding the pathophysiology of incompetent cervix the uterus should be imagined to have three physiologically important portions-body, isthmus and cervix. Body, solely accommodates the pregnancy up to 14 weeks. Isthmus is the lower uterine segment of pregnant uterus, which takes part in accommodating the pregnancy after 14 weeks. Internal os stays closed (throughout the pregnancy) till the onset of labour (Fig 1). Isthmus is a tubular structure in non-pregnant state and first 14 weeks of pregnancy. It is between the internal os below and body of uterus above. The closed and tubular state of isthmus acts as an additional functional cervix above the internal os for first 14 weeks of pregnancy. Thus, even in cases of Incompetent cervix the pregnancies grow undisturbed up to 14 weeks. After 14 weeks the isthmus opens up. If the cervix is competent and hence closed, it allows further continuation of pregnancy. In cases where the cervix is incompetent, and hence open, the products of conception protrude into the cervical canal to initiate Ferguson's reflex.[4] As per the description of this reflex, a distending or dilating force into the cervical canal brings reflex contraction of the uterine body to further push the products into the cervical canal. This sets in a vicious circle of cervical dilatation, uterine contraction, and cervical dilatation (Fig.3). Incompetence of cervix is congenital or acquired. Normal

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cervix has more of fibrous tissue in proportion to muscle. Increase in proportion of muscle or decrease in proportion of fibrous tissue makes it incompetent to stay closed. Acquired incompetence is because of anatomical defects resulting from obstetric or iatrogenic injuries. DES exposure in fetal life is known to cause incompetence of os.[5] Two more entities physiologic or dysfunctional and anatomic are described. Cases where cervical changes of pre-labour start prematurely are said to have physiologic or dysfunctional of genital tract cause cervical distortion or where cervical polyps widen cervical canal are said to have anatomic etiology.

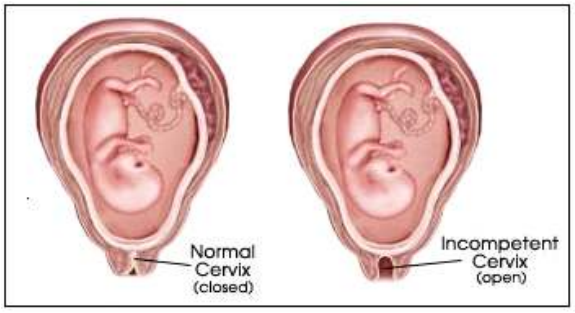

Figure 1

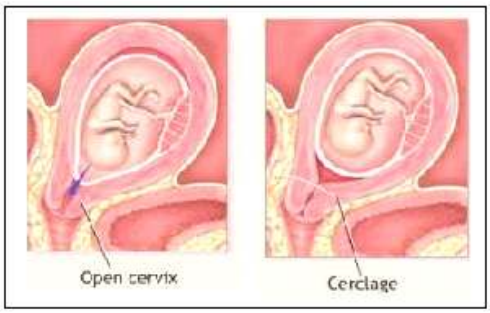

Figure 2

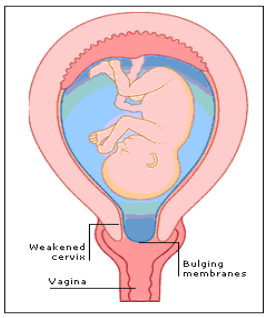

Figure 3

Legend
Figure 1: Normal and incompetent cervix (dysfunctional cervix) [2]
Figure 2: Cerclage[3]
Figure 3: Dysfunctional cervix[6]

The incompetence of os causing abortion and preterm labour is variously quoted between 1/32 delivery and 1/2000 delivery. This probably reflects distinctions made by clinicians in making the diagnosis. On understanding the pathophysiology, the peculiarities of pregnancy loss from incompetence of cervix become obvious. These abortions occur always after completing 14 weeks. Chromosomal anomalies are rare in these abortuses, as chromosomally malformed abortuses are lost in first trimester. The abortion process is usually short and quick, as very little uterine effort (and thereby time) is required to open up the incompetent cervical canal. The symptomatic abortion (painful part) is preceded by increased vaginal discharge. This is because of silent (painless) opening of cervical canal and exposure of membranes to the vagina. The abortuses are usually fresh and live because the well-formed conceptus is subjected to small stress of short abortion process. The symptomatic (painful) abortion is preceded by rupture of membranes, which are weakened on getting exposed to the vagina, its organisms and chemicals. The diagnosis of this condition is pregnant and non-pregnant state is by demonstrating wideness of the cervical canal by direct methods or by images. The various diagnostic techniques used with varied popularity are – No.8 Hegar dilator test (pregnant, non-pregnant), Foley catheter (non-pregnant), olive tip sound (non-pregnant), hysterosalpingography or hysteroisthmography (non-pregnant), ultrasonography (pregnant), rheobase (pregnant), stress relaxation (non-pregnant).[1] Although hysterosalpingography during non-pregnant state and physical state of the cervix on manual examination supported by ultrasonographic measurements of cervical length and width during pregnancy are commonly practiced methods, at most centers treatment by cerclage is resorted to just on obstetric history of repeated pregnancy losses of peculiar pattern. The treatment modalities can be categorized into cerclage techniques, bridging techniques and repair techniques (trachelorrhaphy). Although innumerable, cerclage methods are all based on the principle primarily introduced by Dr. V.N. Shirodkar[7] (Fig.4) and Dr. Mac Donald (Fig.5) i.e. tightening of os. This cerclage is usually placed between 12 weeks and 14 weeks of pregnancy. The stitch is generally removed around the 37th week of gestation.[8] A Shirodkar cerclage is very similar, but the sutures pass through the walls of the cervix so they're not exposed. This type of cerclage is less common and technically more difficult than a McDonald, and is thought (though not proven) to reduce the risk of infection. The Shirodkar procedure sometimes involves a permanent stitch around the cervix which will not be removed and therefore a Caesarean section will be necessary to deliver the baby. The Shirodkar technique was first described by V. N. Shirodkar in Bombay in 1955. In 1963, Shirodkar travelled to NYC to perform the procedure at the New York Hospital of Special Surgery; the procedure was successful, and the baby lived to adulthood.[7] Deep lacerations of cervix make it impossible to put the cerclage stitch by vaginal approach beyond the upper end of laceration. In such cases the cervix is strengthened by transabdominal cerclage (Benson and Durfee) using a nylon type to encircle the isthmus.

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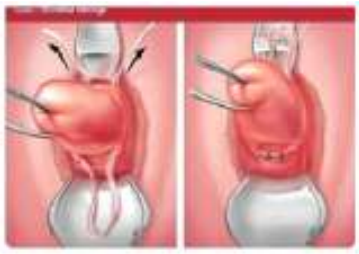
Mechanical and even medical methods have been used with variable success. Mc Donald's method because of its ease of insertion and removal is universally popular. Deeply buried sutures and of thick non-reacting material indicate delivery by caesarean section for reasons of difficulties in removal and reinsertion. The cerclage procedures commonly done are vaginal and post-conception. These are done after 14 weeks, for crevices less than 4 cm dilated, and in the absence of uterine bleeding, ruptured Membranes, fetal anomalies and life threatening maternal complications.

Figure 4A



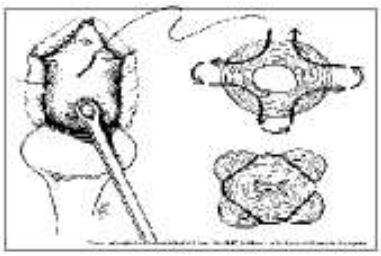


Figure 4B

Figure 5

Legend

Figure 4A: Shirodkar cercolage

Figure 4B: McDonald cerclage[9]

Figure 5: McDonald cerclage : Purse string stitch (the cervix stitching involves a band of suture at the upper part of the cervix)[10]

The post-conception and vaginal methods are popular for the advantages they offer, of not facing first trimester pregnancy complications, ease of inserting and ease of removing the suture. Suture removal for successful cases is done at 38 weeks and in other cases for premature rupture of membranes or premature labour. The commonly practiced cerclage procedure, McDonald's, takes just 10 minutes and hence is done under short or ultra-short intravenous anesthesia.[8] The standards on post-operative care are not yet established but include antibiotic cover, bed rest in head low position, abstinence from heavy lifting and sexual intercourse, tocolytics, progestogens, short courses of ant prostaglandins and betamethasone, and variable duration hospitalization. This makes it difficult to know if the success rates, which are around 85%, are because of the procedure or contribution from "tender loving care". These easy appearing surgical procedures are not free from complications. Suture site infections have caused both minor and major septic complications, suture slippage has resulted into both repetition of procedure and failure. Unremoved sutures result into cervical and uterine injuries. Difficulties in suture removal, lost sutures, membrane rupture, and prostaglandin release during suture placement complications. Clinicians and researchers have expressed doubts on the existence of this condition, on the presently proposed pathophysiology and also on the presently used treatment modalities. This is expressed by, no consensus on diagnostic procedures, by presence of more than 41 surgical methods to strengthen the cervix, by suggesting at least 29 types of suture materials and also by combining surgical and medical methods. However the fact remains that since the presentation of film of his simple cerclage technique by Shirodkar in 1951 in Paris, it's some or the other modification has been effective in reducing the pregnancy losses from cervical insufficiency.

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