Adaptation of Vulcanized Rubber as Pessaries for the Treatment of Utero-Vaginal Prolapse in a Resource-Poor Setting

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Abstract
Four different cases to illustrate medical indications for use of vaginal pessary in the management of Uterovaginal(U-V) prolapse are cited. Ring-shaped vulcanized rubber that serve different functions as vehicle parts were used in these case series due to paucity of modern vaginal pessary in Nigeria market. The first three cases benefited satisfactorily from the use of pessary. The fourth patient had deficient perineum and thus could not benefit from the modified ring pessary.

Introduction

Some degree of utero-vaginal (U-V) prolapse is seen in 50% of parous women with 10-20% of these causing symptoms [1]. This occurs consequent to weakness/injury of endopelvic fascia (mainly the cardinal and uterosacral ligaments) and pelvic floor muscles from progressive denervation in childbirth, pelvic surgery, increased intraabdominal pressure from ascites, large pelvic or intrabdominal tumour, chronic bronchitis, asthma or severe obesity.

Though surgery is the main definitive treatment for symptomatic U-V prolapse in this era of safe anaesthesia, medical management is preferred in the following conditions: A woman still desirous of more children with 3rd degree U-V prolapse, patients who are poor risk for surgery, patients who refuse surgery, U-V prolapse in pregnancy, relieve of acute urinary retention or pain due to incarcerated retroverted uterus in pregnancy, treatment of unsuccessful surgical repair, neonatal pelvic organ prolapse [2]. It is also useful in relieving symptoms while patient is awaiting surgery and as a diagnostic tool amongst patients with stress incontinence to confirm that surgery will be helpful to patient. Other forms of treatment modalities for U-V prolapse include general measures in the forms of estrogen use by menopausal women, physiotherapy and electrical stimulation. These forms of treatment however are only used for mild forms of U-V prolapse.

Unfortunately, the modern vaginal pessary is not available commonly in the Nigeria market. This is probably due to the low prescription rate by doctors and its high cost. The result is that many patients who should benefit from vaginal pessary therapy are denied this benefit. This paper looks at an affordable alternative to the modern ring pessary (Figures 1 & 3) in form of the ring-shaped vulcanized rubber sold as silencer rubber(Figures 2b & 2c) or oil seal rubber (Figure 2a).

The Ring-Shaped Vulcanized Rubber

These are vulcanized rubber, ring-shaped objects sold by road side vehicle spare parts sellers as either silencer rubber or oil seal rubber. Silencer rubber come in different sizes ranging from 4 x 6cm, 7 x 7cm, 9 x 9cm. The smaller sizes are easily available, even in small towns, and are sold at the rate of N50.00 (40 US cents) to N 100.00 (80 US cents). The bigger sizes are usually available in major towns and are sold at the rate of N 250.00 (US$2.00) to N 500.00 (US$4.00). They serve to anchor vehicle exhaust pipes to the body of vehicles and thus reduce unnecessary oscillations and noise.

Oil seal rubbers usually come as 9 X 9cm, they are usually more readily malleable and less rigid compared to both silencer rubber and plastic pessaries and thus more comfortable to insert. They are sold at rates of N 100.00 to N 250.00 It serves to ensure that oil filters fit tightly and do not allow for leakage of engine oil.

Vulcanized rubber can be sterilized by autoclaving, by boiling and putting in sterilizing fluids like 90% alcohol, 3.5% sodium hypochlorite or glutaraldehyde. In the cases cited in this paper, the rubbers were disinfected by putting them inside 3.5% sodium hypochlorite (1:2 dilution) for ten minutes and subsequently rinsed in clean water.
When patients return for follow-up, the rubbers are

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first washed in chlorhexidine solution, after which they are left in sodium hypochlorite solution for about ten minutes. They are washed thereafter in clean water before re-insertion. The plastic pessary (Figures 1 & 3) is not available in the Nigerian market and each will cost about N2,500.00 if available. Another perceived benefit of rubber pessaries is that rubber pessaries are usually more comfortable to wear and are preferred[3].

The importance of counselling of patients on the necessity of keeping follow-up appointments cannot be over-emphasized. If pessaries especially raw rubber materials are left for a long time in the vagina, it can become incarcerated from tissue reaction following progressive degradation, this can lead to chronic vaginal discharge, vaginal bleeding, chronic irritation and rarely cervical/vaginal carcinoma. It should be noted that these complications can also occur with use of modern inert plastic pessary if neglected and it becomes incarcerated.

It is suggested that rubber pessary be removed for cleaning/sterilization every eight to twelve weeks after the initial four- week check post insertion whereas plastic pessary could be removed 6 monthly to yearly after the initial post insertion check at 3months [4].

Patient 1

Mrs. A.S. is a 24-year-old Para 2^{+0}, 2 alive woman whose last confinement was 8 months prior to presentation. She presented to the gynaecological clinic of LAUTECH Teaching Hospital (LTH) with complaint of something protruding through her private part of 8 months' duration.

Her complaint started shortly after her last birth in a mission house where she laboured for about sixteen hours and eventually delivered a live male baby of average size (weight unknown). Discharged on the second post-natal day, she soon began to have the feeling of something coming down her perineum. Initially she could only touch it just inside her vagina, but with time, she could touch and see it outside her the vulva, especially when in the erect position. It was later associated with discomfort when walking or standing erect. She could reduce the mass when she lay down, but it popped out as soon as she got up. Her first confinement was in the same mission home and lasted two days with eventual vaginal delivery of an average sized live female infant (weight unknown). The babies are doing well however. She went to a private clinic where she was referred to our gynaecological clinic.

On examination she looked disturbed, was not clinically pale and had no abnormalities in the cardiovascular system. There was good air entry bilaterally into the chest. She had no palpable mass in the abdomen. Pelvic examination revealed a 3rd degree uterovaginal prolapse with mild cystocoele and a mildly inflamed cervix. There was no vaginal wall ulceration.

Her haematocrit was 32% and white cell count was within normal range. Urine microscopy was normal. She desired to have more children. The surgical option was to offer her a Manchester repair, but because she had a 3rd degree prolapse, with no cervical elongation, the chance of been helped by surgery was considered small and the option of being helped by surgery was abandoned. The search for a vaginal pessary began after she was counselled for it and had consented. After one month of several contacts with medical suppliers in major cities and discussion with more senior colleagues on how to get vaginal pessaries, it became clear that the modern vaginal pessary was hard to come by in the Nigerian market. The authors, out of curiosity, thought of a way out to relieve this woman's discomfort. The option of a ring-shaped vulcanized rubber (sold as silencer rubber) was considered. This was sterilized and inserted will little discomfort. Test of fitness was done and found to be satisfactory. She was seen a week later with no complaint. She was urinating well and was able to have coitus with her husband. She had it removed after two weeks for cleaning and sterilization and subsequently two monthly. At her 4th follow-up appointment (about 28weeks from first insertion) after removal of the silencer rubber it was discovered that there was no descent of the uterus for the whole of the period she stayed to have re-insertion of the device. She was made to cough, squat and jump, yet no descent was observed. She was asked to go back home without re-insertion and to present in a week. On her return visit, she had no complaint and yet no descent of uterus. She has since then been on three-monthly follow-up. She remained well till the time of this report, a year following the discontinuation of the vulcanised rubber pessary.

Patient 2

Mrs A.K, a 48 year old Para 6^{+2} 5 alive, two-year post-menopausal woman presented to the Gynaecological clinic of LAUTECH Teaching hospital with 1 year history of a mass protruding from her private part. She first had the feeling of a mass coming down her genitalia a year before. The mass reduced itself spontaneously on lying down initially. With time, she had to reduce it manually. In the preceding six months, the mass had been irreducible.

She was two years postmenopausal and her last confinement was 12 years prior to presentation. All her deliveries were attended to by traditional birth attendants at home except for the last confinement in which she laboured on the farm for two days and subsequently delivered a female baby in breech presentation. She was a petty trader and a widow with

no history of medical illness or previous surgery.

She was a middle-aged woman, not clinically pale and afebrile. There was good air entry bilaterally. Her pulse rate wass 78 beats per minute and regular; her blood pressure was 110/60mmHg. The abdomen was flat with no area of tenderness and no mass palpable. She had a small ulcer on the medial aspect of the left thigh. There was a second degree utero-vaginal prolapse and mild cystocoele. There was no cervical ulceration. She had a vulcanised rubber pessary inserted to relieve her symptoms and was given two weeks appointment to be reviewed with the results of investigations. Her packed cell volume was 32%, urinalysis and abdominopelvic ultrasound scan were normal.

She was counselled for vaginal hysterectomy to which she agreed but could not afford the cost of surgery. After three months, the pessary was in place, the ulcer on the thigh had healed but her cystocoele was still evident. The rubber pessary was washed, disinfected in hypochlorite solution and replaced. She has been seen at three-month intervals twice thereafter but is yet to get money for surgery.

Patient 3

Mrs. A.S. is a 55year old P_4^{+1} 4 alive post-menopausal retired matron who presented to the Gynaecological clinic of LTH with 3 months history of something protruding from her vulva. She was well until 3 month prior to presentation when she felt something protruding from her genitalia. The mass had gradually become visible with time and she could reduce it but its sight made her uncomfortable.

Her first three confinements were spontaneous vaginal delivery. Her last confinement 20 years ago was by emergency caesarean section for cephalopelvic disproportion on account of a big baby. A retired nurse, now 4 years post-menopausal, she was a known asthmatic patient who last had an attack more than one year before.

Her general condition was satisfactory and no abnormalities were found in the cardiovascular or respiratory systems. She had a second-degree utero-vaginal prolapse. There was no vaginal, cervical or perineal ulceration. Her packed cell volume was 35%.

She was counselled to have vaginal hysterectomy but declined any form of surgery. She consented to wearing vaginal pessary and was able to get an oil-seal vulcanised rubber (Figure 2a) that fitted appropriately after reduction of the prolapsed uterus. She has been seen twice thereafter, satisfied with her treatment and has been reporting every 3 months for cleaning and re-insertion of the pessary.

Patient 4

Mrs. S.B was a 68 year old trader, Para 6^{+2}, 3 alive and 15 years postmenopausal. She was reviewed in the female medical ward of LAUTECH Teaching Hospital on request because she complained of discomfort in her genitalia of one week duration and a mass protruding from her vulva of 4 years' duration. She was being managed for severe heart disease (New York Heart Classification: Grade IV) from suspected dilated cardiomyopathy. All her deliveries were by spontaneous vaginal delivery and were essentially uneventful.

She was ill-looking, in cardiac position and in respiratory distress with flaring alae nasi. She had bilateral pedal oedema up to the knees and sacral oedema. The pulse rate was 100 beats/minute, feeble, with occasional missed beats. Blood pressure was 130/100mmHg. Jugular venous pressure was raised, heart sounds I, II and III were heard but sounded distant. There were basal chest crackles. There was demonstrable ascites, the liver was enlarged, smooth and tender. She had a gaping deficient perineum with third degree utero-vaginal prolapse. The uterus appeared oedematous, with ulcers on the cervix. We offered her different sizes of the rubber ring pessary, but because of the deficient perineum and the increased intrabdominal pressure, the pessaries kept falling out. She eventually died 2 weeks after review from her medical condition.

Discussion

Using rubber as a form of ring pessary is not entirely new as pessaries were made originally of rubber. Rubber, after some time in the body, gets degraded and can lead to worrisome vaginal discharge. Vulcanized rubber(rubber mixed with sulphur in the presence of accelerators) is less easily degraded and when it is removed intermittently for washing before replacement, this essentially removes the risk of degradation [3]. Modern vaginal pessaries are made of inert substances like silicone and polythene. They are less prone to cause tissue reaction compared to rubber pessaries. The vulcanised rubber adapted vaginal pessaries in the cases cited had minimal risk of degradation after prolonged stay in the body [4].

The first patient was not a suitable case for surgical management for the reasons earlier stated but the use of the vulcanised rubber pessary served as a stop-gap while her pelvic soft tissue regained their tone after childbirth. Possible favorable factors that could explain this observation are the fact that she is young, in the active reproductive age group and with good supporting levels of oestrogens. Surgical treatment was appropriate in the second patient and she was counselled accordingly to have vaginal hysterectomy with pelvic floor repair. She consented to have surgery

done but could not raise the funds needed. The third patient refused surgery while the fourth was too ill. Hence, medical and socio-economic indications for the use of vaginal pessaries abound among Nigerian gynaecological patients. The use of vulcanized rubber adapted as vaginal pessary due to lack of modern inert vaginal pessary in Nigerian market will bring a lot of relief to many of these clients at minimal cost. With proper counselling of clients to keep short follow-up appointments, side effects can be reduced to acceptable levels as seen in cases cited.

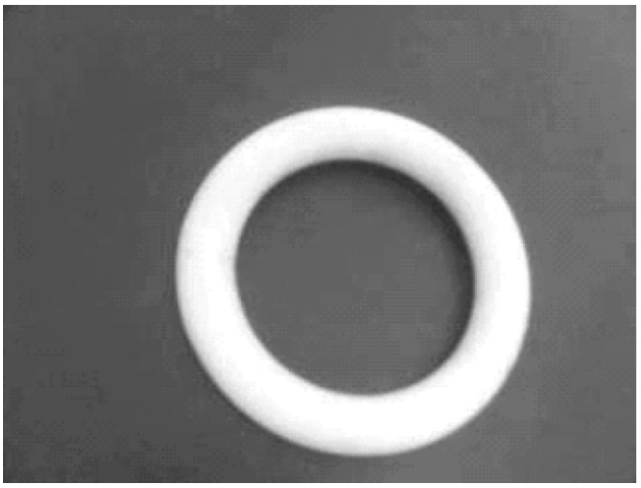

Fig 1: vaginal pessary

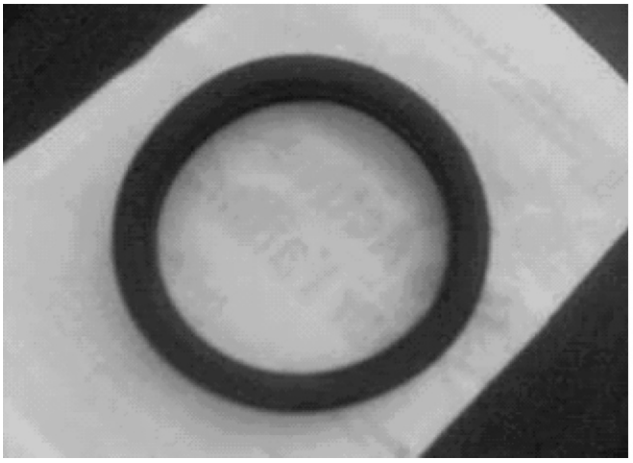

Fig 2a: Oil seal rubber

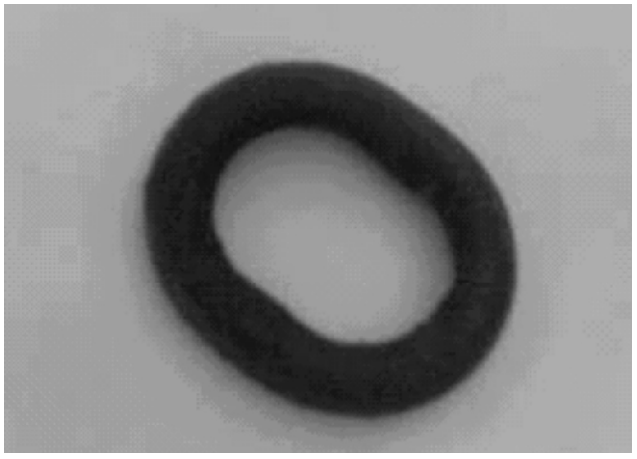

Fig 2b: Silencer rubber

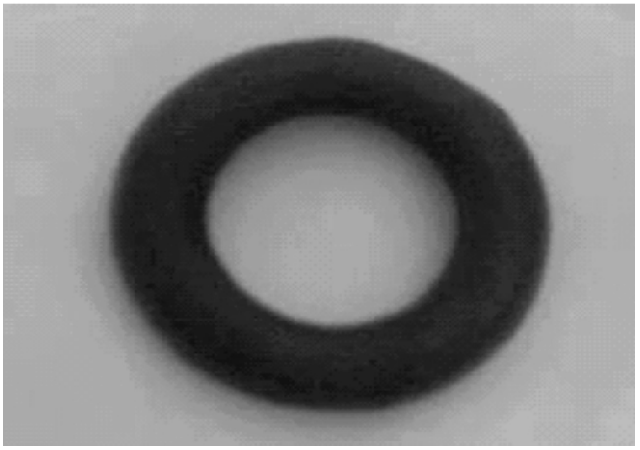

Fig 2c: Silencer rubber

Fig 3: Modern vaginal pessaries

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