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INSTRUMENTATION AND TECHNIQUES

Customized Silicone Vaginal Stent

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About the Author

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Introduction

Mayer-Rokitansky-Kuster-Hauser (MRKH) syndrome, a congenital anomaly of the female genital tract, is characterized by vaginal agenesis, a rudimentary to absent uterus compromising the normal functions of the genital tract, thereby causing psychological trauma. This syndrome is estimated to occur in approximately 1 in every 4500 females [1]. Patients with vaginal agenesis in MRKH syndrome can be treated by both surgical and non-surgical procedures. However irrespective of the procedure opted, prosthetic vaginal dilators or long-term vaginal stents are required to prevent the possible contraction of the reconstructed vagina and to maintain vaginal width and depth to avoid vaginal stenosis.

The use of prosthetic vaginal dilators for non-surgical procedure for the creation of neovagina for patients with

complete Mullerian agenesis is usually considered the first line of treatment if suitable. Vaginal dilators (Hegar candles) are indicated only when the vaginal dimple is deep enough (2–4 cm). Due to its elastic nature, the vaginal tissue has the tendency to expand during the insertion of a dilator. To accomplish the tissue expansion, customized stents are made, with increasing measurements in its length and diameter over a period of time.

However, vaginal stents are used postoperatively to maintain vaginal width and depth and to prevent contraction or shrinkage and stricture of neovagina, and it also serves as hemostat. Failure to wear a stent, even if it is inconvenient, is the major cause of failure. Several prefabricated or customized stents have been described for postoperative maintenance after vaginoplasty, such as ORFIT "S" vaginal stent, tissue expander, simple syringe, vacuum expandable condom mold, inflatable stents, and acrylic, hollow acrylic or acrylic stents lined with silicones [2, 3]. However, prefabricated stents made from medical grade plastics and acrylic are hard, costly, and are not suitable for all clinical situations owing to the varying anatomies of the defect.

So far, the literature review has not revealed much information about complete silicone vaginal stent and fabrication of the same. In this case report, we have made a vaginal stent using silicone which not only maintains the shape but also provides comfort to the patient due to its soft nature. A thorough search has revealed that not much information has been reported in the literature regarding silicone vaginal stent. This case report describes the advantages, disadvantages, and procedure of fabrication of the customized silicone vaginal stents.

Outline of the Case

A 15-year-old female patient was referred to the Department of Prosthodontics, from the Department of Plastic Surgery, for the fabrication of vaginal stent. This patient had undergone vaginal reconstruction 1 month back at a private hospital. During the surgery, a full-thickness graft was raised in the midline of the vagina and placed on the posterior wall. A prefabricated acrylic stent was secured over the surgical area which patient was wearing from the time of surgery. The patient was referred to our department since she was uncomfortable with the current stent which she felt was hard, too bulky, and hindered her normal activities. Ultrasonography revealed a vaginal opening measuring 5.21 cm in diameter and 12.35 cm in length. Since the patient was uncomfortable with previous hard acrylic stent, it was planned to use silicone which is a softer and lighter material than acrylic for the stent. The procedure, time duration, and cost of making a stent were explained to the patient, and a written consent was obtained before the commencement of the treatment.

Vaseline was applied in the vaginal cavity, and a replica (impression) was made on the handle of a sterilized mouth mirror using the impression material (addition of silicone material, with putty consistency) [Exaflex (putty) GC America Inc, Illinois, USA]. A mold cavity was obtained using the impression using a modified plaster (class IV die stone) [Pearlstone, Diestone IV, Asian chemical, Rajkot, India] (Figs. 1, 2) The mold obtained was used for the fabrication of the stent using maxillofacial silicone [Room temperature vulcanizing (RTV) 2186 silicone elastomer, Factor II Inc, Lakeside, USA]. The prosthesis was soft, lightweight, cylindrical and rounded on the top to allow ease in insertion and a base to help in easy removal.

The vaginal stent was inserted into the patient for 2 weeks. The patient was advised to use the prosthesis with the help of a lubricant anesthetic jelly to allow easy and less painful insertion for a duration of 4–5 h a day for a period of 2 weeks. Pressure was applied and maintained by the use of tight underwear. Instructions were given to the patient about the maintenance of personal hygiene and that of the stent. Patient was advised for thorough washing of the stent under fast running water and cleansing with a mild vaginal wash before and after usage to prevent fungal growth. After using the stent for 2 weeks, the patient found silicone prosthesis more comfortable and lightweight to carry out her normal activities.

Discussion

Management of MRKH syndrome is very contentious as the choice of procedure for reconstruction depends on individual anatomy, fertility potential, and social factors. The ideal time for intervention is at or after adolescence when the woman has reached physical and psychosocial maturity so that she is involved in decision making and provides increased compliance with adjuvant dilatation methods.

Diagnosis to confirm the presence of this syndrome involves methods such as transabdominal ultrasonography, magnetic resonance imaging, celioscopy, and the genetic status of the patient. Among these, the ultrasound must be the first investigation in evaluating patients with suspected Mullerian aplasia since it is more sensitive, simple, and a non-invasive method.

In this case, the patient felt that the prosthetic vaginal stents made with acrylic resin (which she was using post-surgery) were heavier and harder than those made with silicone material. She could not wear it since it was hurting the raw wound. In this case, we have used soft silicone

Fig. 1 Making of a replica

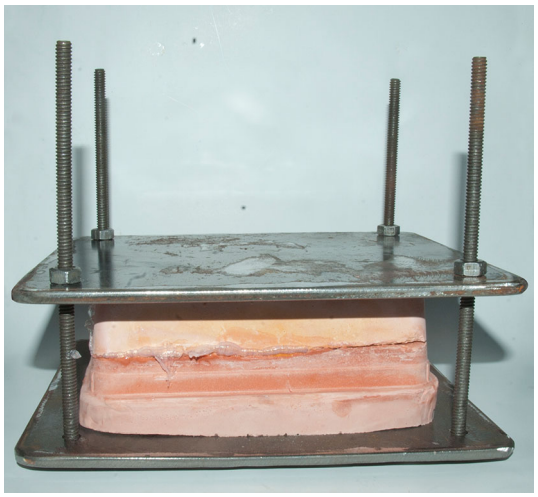

Fig. 2 Making of a mold cavity

which suited the requirement and also is not reported in the literature. Silicone has high biocompatibility and is a softer, flexible, and light-weight material; it helped the patient to carry out her daily activities without any hindrance. Insertion of material blindly results in defective impressions due to the irregular cavity postsurgery. Use of acrylic candle as a carrier sometimes causes irritation of the delicate mucosa due to the monomer content of acrylic which is an irritant. In this case report, a sterilized mouth mirror is used as a carrier which is convenient for the operator due to the length and hand grip provided by the sturdy handle. The material used for making impression (replica) is an elastomeric material which is biocompatible and non-irritant to the tissues.

In this case report, silicone, a biocompatible material, is used for fabrication of customized vaginal stent. However, the same method can be utilized for making acrylic or hollow acrylic stent. This mold design can be modified to any length or thickness required for making vaginal stent according to the clinical situation.

Silicone vaginal stents if not maintained properly can be prone to fungal infections and deterioration with time. Moreover, it is costly compared to acrylic resin and have the tendency to tear in long-term use and may require refabrication. But owing to its flexibility, softness, light-weight, and the comfort it offers, these disadvantages are disregarded. All these factors increased the confidence of the patient to perform her normal activities, thereby improving her quality of life.

Conclusion

This case report describes the use of silicone for making customized vaginal stent. The silicone prosthesis was found to be very comfortable for the patient due to its softness, smooth texture, and lightweight and improved the overall quality of life of the patient.

Conflict of Interest Dr. Jothikumar, Dr. Varsha Murthy, Dr. Kularashmi, and Dr. Kirti Jajoo declare that they have no conflicts of interest.

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