A Technique for Vaginal Casting Utilizing Vinyl Polysiloxane Dental Impression Material

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Introduction

Reported dimensions of adult vaginas are primarily limited to measurements of length [1–4]. With the exception of Dickinson [1], authors have failed to address the three-dimensional shape of the vagina and the development of the cervix and fornices. Moreover, although pelvic relaxation accompanying childbirth is quite common [5], the associated changes in vaginal shape and curvature have not been documented. This paper describes a casting technique appropriate for visualization of vaginal curvature and dimensions, information which can be useful to the surgeon, gynecologist, or manufacturer of vaginal products.

Materials and Methods

Two subjects, one nulliparous and one uniparous, delivered by cesarean section, volunteered for the project. Subjects were fully informed about the protocol and gave written consent. Each subject was asked to wash her perineum with warm soapy water and douche with plain tap water prior to casting. Each subject assumed a supine position on an examining table. A small amount of baby oil was applied to the pubic hair to facilitate release of any leaked molding material. A 6-inch spoon with a 1-inch bowl was warmed and gently inserted as far back into the vagina as possible with the bowl in the vertical position. A 3M Express™ Vinyl Polysiloxane Impression Material System consisting of a Kerr Express Syringe Gun equipped with a medium body purple vinyl polysiloxane cylinder with a 3-inch nozzle (fig. 1) was used to insert the molding material. Just before insertion a small quantity of the molding material was expressed from the tip of the nozzle to insure proper polymerization. Then the molding gun and nozzle were inserted into the vagina, and one half of the cylinder (approximately 50 ml) was injected. Then the spoon and molding gun were removed, and the subject digitally inserted a junior tampon to be used as a retriever. The gun was reinserted and additional molding material was deposited as the

Fig. 1. Kerr Express™ Impression Material System with Kerr Express Syringe and vinyl polysiloxane cylinders. × 0.2.

nozzle was slowly withdrawn until the anterior vagina was filled and the material extruded from the introitus. If necessary a portion of a second cylinder was utilized.

After a total of 10 min, the cast was loosened and lubricated with KY™ jelly until it turned in the vagina under the pressure of digital manipulation. The subject then assumed a squatting position or a standing position with one knee elevated and bent and removed the cast by gently pulling on the tampon string and pushing with her pelvic muscles. After the cast was removed, the subject was provided with a Betadine douche to protect against unintentional infection.

Results

Full vaginal casts (fig. 2, 3) were obtained from both subjects. Casts showed clear definition of rugae, as well as of the anterior and posterior fornices. The nulliparous cast exhibited classical 'S' curvature as described in standard anatomical texts. However, the anterior and posterior fornices were not nearly so deep as those of the uniparous cast. In addition to a clearly defined anterior

for-
122

Pendergrass/Reeves/Belovic

accompanying pregnancy. Moreover these casts can be used by surgeons to assist in location of incisions and analysis of reconstruction potential. The analysis of variations in vaginal size, shape and distensibility enabled by this technique should provide information of considerable use to manufacturers of vaginal products and devices.

The dental casting material selected for this project is certified by the American Dental Association; it is hy-poallergenic and safe for usage in the human mouth [6]. Furthermore, it is closely related to the class of polysilox-anes used in vaginal rings which are left in the vagina for up to 21 days in order to deliver steroids [7]. Considering the similarity in the epithelial linings of the mouth and vagina, and that vaginal tissues can be transplanted to the mouth during reconstruction, thus demonstrating their compatible physiologies, no adverse effects from the material itself are anticipated.

Fig. 2. Full vaginal cast of nulliparous, sexually active subject. Note the Classical 'S' curvature and the shallow fornices. $\times 0.6$.

Fig. 3. Full vaginal cast of uniparous subject delivered by cesar-ean section. Note the well-defined anterior and the distended posterior fornices. The inverted curvature of the anterior vagina indicates pelvic relaxation. $\times 0.6$.

nix, the uniparous cast exhibited marked distension of the posterior fornix, usually associated with sexual activity and pregnancy. Pelvic relaxation had occurred in this subject as evidenced by the inverted curvature of the anterior vagina.

The expanded posterior fornix of the uniparous subject made the cast somewhat difficult to loosen and remove. The subject reported mild introital itching and increased desire to urinate for several hours after removal. Cast removal from the nulliparous subject was without incident.

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Discussion

The casting technique described here provides three-dimensional visualization of vaginal shape and development of the fornices. By using this technique the physician can recognize and diagnose vaginal alterations associated with clinical symptoms such as pelvic relaxation