Psychosexual and functional outcomes after creation of a neovagina with laparoscopic Davydov in patients with vaginal agenesis

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Objective: To describe sexual function and satisfaction after laparoscopic Davydov vaginoplasty in patients with an absent vagina due to Mayer-Rokitansky-Kuster-Hauser syndrome or androgen insensitivity syndrome compared with a control female population.


Setting: Two tertiary care hospitals at an academic medical center.

Patient(s): Six women with Mayer-Rokitansky-Kuster-Hauser syndrome or androgen insensitivity syndrome who underwent laparoscopic Davydov.

Intervention(s): Patients postoperatively completed a self-report survey of their medical, surgical, and sexual history and the standardized, validated Female Sexual Function Index (FSFI) and select questions from the Golombok Rust Inventory of Sexual Satisfaction (GRISS).

Main Outcome Measure(s): Total scores and domain scores (desire, arousal, lubrication, orgasm, pain, satisfaction) on the FSFI were compared with a published control population of women. Descriptive results of domain questions on the selected questions of the GRISS were identified.

Result(s): Six patients, aged 20–52 years, returned the questionnaires. Responses to the modified GRISS are represented by visual frequency of response bar graphs. Compared with the control population, the patients’ scores were lower for arousability, lubrication, orgasm, and comfort on the FSFI.

Conclusion(s): Sexual function appears impaired in these six women who underwent laparoscopic Davydov as assessed by the FSFI. This may reflect characteristics of the patient population, as well as the inclusion of all patients’ data even if they did not attempt vaginal intercourse in the previous month. (Fertil Steril® 2010; ■: ■ – ■. ©2010 by American Society for Reproductive Medicine.)

Key Words: Mullerian agenesis, Mayer-Rokitansky-Kuster-Hauser syndrome, androgen insensitivity syndrome, Davydov, sexual function, vaginoplasty, surgical therapy, neovagina

Vaginal agenesis due to Mayer-Rokitansky-Kuster-Hauser (MRKH) syndrome or androgen insensitivity syndrome occurs in approximately 1 in 5,000 and 1 in 20,000 live female births, respectively. The standard technique recommended by experts for creation of a neovagina is by gradual self-dilation with the support of a multidisciplinary team (1). In the rare cases of failed vaginal dilation, various surgical methods have been used for creation of a neovagina. Most surgical methods involve creating a neovaginal space and lining the space with different materials: split-thickness skin graft (McIndoe procedure) (2), buccal mucosa or artificial skin; colovaginoplasty (3); or the Davydov procedure using pelvic peritoneum (4–6). The Vecchietti procedure is an alternative whereby the neovagina is created by dilation with a traction device attached with wires to a Lucite olive placed at the vestibule (7).

Davydov vaginoplasty may be performed by laparotomy (6) or with laparoscopic assistance. At least five case series have described creation of a neovagina by laparoscopic Davydov (4, 8–11). Several studies report patients’ sexual function after surgical creation of a neovagina (2, 3, 7, 12–18). At present only one study, however, reports validated psychosexual outcomes after laparoscopic Davydov (5).

The objective of this study is to describe patients’ self reported sexual function and satisfaction after laparoscopic Davydov vaginoplasty and compare them to a control (no disorder of sexual development, nonsurgical) female population described in the literature (19).

MATERIALS AND METHODS

With Research Ethics Board approval at Mount Sinai Hospital and St. Michael’s Hospital, (REB# 04-0282-E and 04-251C respectively) nine patients with MRKH or androgen insensitivity syndrome who underwent laparoscopic Davydov with the same surgical team in Toronto, Canada, between September 2004 and May 2006 were mailed a study questionnaire after

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<table>
<thead>
<tr>
<th>Patient</th>
<th>Age (y)</th>
<th>Diagnosis</th>
<th>Reason for diagnosis</th>
<th>Relationship status</th>
<th>Surgery</th>
<th>Ethnicity</th>
<th>FSFI (total score)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24</td>
<td>AIS</td>
<td>Birth</td>
<td>Common law</td>
<td>Vaginoplast</td>
<td>White</td>
<td>13.5</td>
</tr>
<tr>
<td>2</td>
<td>23</td>
<td>Don't know</td>
<td>Amenorrhea</td>
<td>No partner</td>
<td>No</td>
<td>White</td>
<td>22.4</td>
</tr>
<tr>
<td>3</td>
<td>52</td>
<td>Vaginal agenesis</td>
<td>No</td>
<td>Single (with sexual partner)</td>
<td>Yes after first surgery</td>
<td>White</td>
<td>19</td>
</tr>
<tr>
<td>4</td>
<td>23</td>
<td>Vaginal agenesis</td>
<td>No</td>
<td>Single (with partner)</td>
<td>None</td>
<td>No</td>
<td>19.4</td>
</tr>
<tr>
<td>5</td>
<td>27</td>
<td>Don't know</td>
<td>Mary amenorrhea</td>
<td>None</td>
<td>No</td>
<td>Filipino/Asian</td>
<td>27.8</td>
</tr>
</tbody>
</table>

Note: FSFI = Female Sexual Function Index; AIS = Androgen insensitivity syndrome; MURCS = Mullerian duct aplasia, renal aplasia, and cervicothoracic somite dysplasia; IC = intercourse.

with a sexual partner, and two indicated that they had no current sexual partner (Table 1).

Responses to the modified GRISS are represented visually in Table 2. Each response to a question is indicated by an asterisk. In each row, the left side represents a poorer outcome, and the right side, a better outcome. Not each respondent answered each question of the survey. The first row illustrates responses to questions on the theme of interest/desire. Four patients never refuse to have sex with their partners, however, three usually or always become tense and anxious when their partner wishes to have sex. Row 2 depicts responses to questions about arousal. Five women occasionally, usually, or always become easily aroused, with a similar proportion of women reporting lubrication with intercourse. All of those who responded to the question usually or always enjoy genital contact in a nonpenetrative manner. Row 3 illustrates responses to questions about vaginal size. Although all patients hardly ever or never have difficulty inserting fingers into their vaginas, three occasionally or usually find their vaginas too tight for penile entry, and four occasionally or usually find penile entry uncomfortable. Row 4 depicts responses to questions about orgasm. Three patients reported that they hardly ever or never experience an orgasm with their partner. However, three women answered that they usually or always achieve orgasm with clitoral stimulation. Finally, row 5 illustrates responses to questions about satisfaction. Three patients hardly ever find their relationship with their partner satisfactory, and three patients hardly ever or never feel love and affection in their sexual relationship with their partner. Three women reported that they usually or always enjoy having sexual intercourse with their partner.

Table 3 shows the FSFI scores of the patients compared with the scores of the control population. The FSFI scores are calculated with a maximum of 6 for each domain and 36 for the total. Compared with the control population, the patients’ scores were statistically significantly lower in the domains of arousability, lubrication, orgasm, and comfort.

Total scores less than 23 are considered “poor,” scores of 24–29 are considered “good,” and scores more than 30 are considered “very good” (3, 5). Total FSFI scores in patients were 13.5–27.8, mean 21.4 ± 5.3 versus 30 ± 5 in the control population (P = .005).

**DISCUSSION**

For women with vaginal agenesis who fail dilation therapy for creation of a neovagina, there exist many potential surgical alternatives. The ideal surgical procedure should be simple, with minimal complications, a short recovery, create a vagina of adequate depth and width, ideally of stratified squamous epithelium (vaginal mucosa), and most important allow for satisfying sexual function. At present limited data are available on psychosexual surgical

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**TABLE 2**

<table>
<thead>
<tr>
<th>Theme</th>
<th>Question</th>
<th>Always</th>
<th>Usually</th>
<th>Occasionally</th>
<th>Hardly ever</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest and desire</td>
<td>Do you feel interested in sex?</td>
<td></td>
<td></td>
<td>****</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are there weeks when you don’t have sex?</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do you avoid having sex with your partner?</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do you become tense and anxious when you &amp; your partner want to have sex?</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do you refuse to have sex with your partner?</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Arousal</td>
<td>Do you become easily aroused?</td>
<td>**</td>
<td>**</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do you enjoy having your genitals stroked?</td>
<td>**</td>
<td>**</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Does your vagina become moist during intercourse?</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Vaginal Size</td>
<td>Do you find your vagina is so tight that your partner’s penis can’t enter it?</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is it impossible to insert your finger into your vagina without discomfort?</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is it impossible for your partner’s penis to enter your vagina without discomfort?</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Orgasm</td>
<td>Are you able to experience an orgasm with your partner?</td>
<td>**</td>
<td>**</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do you find it possible to have an orgasm?</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Can you reach orgasm when your partner stimulates your clitoris?</td>
<td>**</td>
<td>**</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Satisfaction</td>
<td>Do you find your sexual relationship with your partner satisfactory?</td>
<td>***</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do you enjoy having sexual intercourse with your partner?</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do you feel there is love and affection in your sexual relationship with your partner?</td>
<td></td>
<td></td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

*Note: See text for explanation of asterisks.*

outcomes using validated measures to guide patient and surgical
choices.
Based on the results of a self administered questionnaire, at 6
months postoperative, sexual function appears impaired in the cur-
rent study of six women who underwent laparoscopic Davydov
compared with controls. The FSFI scores of the patients were statis-
tically significantly lower, both as a total value and in the domains of
arousability, lubrication, orgasm, and comfort.
A validated psychosocial assessment using the FSFI, after neova-
ginal surgery has been applied following the Vechietti procedure,
sigmoid colpopoiesis, and the laparoscopic Davydov (3, 5, 7). A
study of the Vechietti procedure administered the FSFI to 27
women with MRKH 12 months after surgery. These patients had
similar scores as controls in the domains of desire, arousal, and
satisfaction, but statistically lower in lubrication, orgasm, and
comfort (7). Communal et al. (3) reported on sexual function in
16 consecutive patients with MRKH after sigmoid colpopoiesis.
Their overall mean FSFI score was 28 ± 5, with little difference
from healthy patients for each domain of sexual function. Giannesi
et al. (5) applied the FSFI to 28 women after a laparoscopic Davydov
procedure. The full score did not differ from their control group, nor
did they find statistically significant differences in any of the
domains between the patients undergoing surgery and their controls;
however, they did find a trend to less satisfying sexuality in the
patients undergoing surgery, with the most difference in the domain
related to comfort and lubrication.
The desire domain on the FSFI was one of the two domains not
statistically significantly different from women without DSD (con-
trols in the current study). The GRISS questions on how easily
women become aroused, enjoyment of nonpenetrative sex, and lub-
rication were answered more positively than other question group-
ings overall. Hence interest in sexuality after surgery is maintained;
however, challenges persist with regard to the physical aspects of the
vagina.
Three of the patients reported that they “would like (their) vagi-
nas longer.” This is consistent with the GRISS responses with regard
to penetrative intercourse, where 66% answered that it is impossible
for the penis to enter their vagina without discomfort and with the
lower scores on the FSFI domain of comfort. It may therefore be ap-
propriate for our team to reassess the length and width of the vaginal
mold used in our setting, something that varies among different
surgeons performing this procedure.
Despite that the surgery pertained to only the vagina, orgasmic
capacity was reported dichotomously. Half the GRISS responses
indicated good orgasmic response with clitoral stimulation, yet
50% of women reported that they never or usually never were
able to achieve orgasm with their partner. The orgasm domain of
the FSFI was statistically lower than controls. Another series as-
sessing patients with MRKH using the FSFI after Vechietti vagino-
plasty demonstrated similar differences in the orgasm domain from
patient controls (7). Given that neither surgical procedure
should impact on the sensate nature of the clitoris, these results
emphasize that for women with DSD diagnoses the assumption
that creation of a vagina will resolve any sexual dysfunction is
incorrect. Women might have discomfort after surgical colpopoiesis
related to functional length of the neovagina; however, the discom-
fort could also relate to emotional barriers with secondary vaginismus.
Although the first explanation may require a change in surgical technique, the latter requires a different, multidisciplinary
management approach that may include psychology, psychiatry,
and sexual therapy.
A limitation to our study design is the fact that the current study
protocol only assessed the women postoperatively. We have no
knowledge of the women’s sexual function on the six domains as-
sessed before surgery. It is conceivable that the surgery enhanced
the women’s sexual function and decreased disorder in these do-
mains but not to the level of a non-DSD, nonsurgical population
(the control group) (19).
In conclusion, sexual function appears impaired in these six
women who underwent laparoscopic Davydov compared with con-
trols. These results differ from a previous report on sexual function-
ing after laparoscopic Davydov (5). Poorer scores may be attributed
to the inclusion of all patients’ data, even if they reported no attempt
at vaginal intercourse in the past 4 weeks. Lower scores may also re-
fect differences in the study patient population; more patients in this
group had failed dilation or undergone previous surgery. Our patient
population consisted solely of women who had failed vaginal dilatation and in 33% also failed previous surgical procedures.
Overall, however, these results require reflection on current surgical tech-
nique and on surgical neovaginoplasty compared with vaginal
dilation. They also emphasize the need for perioperative support,
not only from the surgeon but ideally from psychology and sexual
therapy to optimize outcomes.
Future studies should address preoperative sexual function com-
pared with postoperative sexual function after creation of a neova-
gina, and should compare sexual function in women using vaginal
dilation exclusively versus women who have undergone each of
the various surgical approaches. We advise assessment of sexuality
separate from clinical assessments by surgeons to allow women to
answer in a more forthright manner.

<table>
<thead>
<tr>
<th>Female Sexual Function Index (FSFI) scores.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controls, mean ± SD (n = 131)</td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>Desire</td>
</tr>
<tr>
<td>Arousalability</td>
</tr>
<tr>
<td>Lubrication</td>
</tr>
<tr>
<td>Orgasm</td>
</tr>
<tr>
<td>Satisfaction</td>
</tr>
<tr>
<td>Comfort</td>
</tr>
<tr>
<td>Full score</td>
</tr>
</tbody>
</table>

* Statistically significant differences from the control population.


