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Original Research Article

SURGICAL VS. NON-SURGICAL APPROACHES IN VAGINAL AGENESIS: A SYSTEMATIC REVIEW

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ABSTRACT

Introduction. Vaginal agenesis is the rudimentary or complete absence of vagina. The treatment of vaginal agenesis consists of various surgical and non-surgical techniques. This systematic review aims to describe the differences between surgical and non-surgical techniques of vaginal agenesis treatment in terms of vaginal length and sexual function. **Method.** Electronic databases such as PubMed, Science Direct, and SCOPUS were searched for articles published between 2018-2023. Literature restricted for women with vaginal agenesis who underwent surgical or non-surgical techniques was reviewed. Cross-sectional studies, observational studies, cohort studies, and retrospective studies were included in this study. Out of 190 articles, 8 articles were analyzed. All studies that reported total vaginal length and sexual function after treatment were conducted. **Result & Analysis.** The mean total vaginal length in the non-surgical technique was 7.23 cm and 8.88 cm in the surgical technique. Meanwhile, the level of sexual function, as measured using the Female Sexual Function Index (FSFI) score, showed a result of 24.40 in non- surgical techniques and 25.23 in surgical techniques. There is also one article with surgical techniques that assesses the level of sexual function objectively, resulting in sexual function within normal limits. **Discussion.** Total vaginal length in both techniques was normal but not on the FSFI scores. However, surgical techniques showed a slightly higher outcome Even so, non-surgical techniques are also a good treatment option considering the outcome are not much different compared to surgical techniques.

Keywords: MRKH, Non-Surgical, Surgical, Vaginal Agenesis

INTRODUCTION

Vaginal agenesis is a rudimentary or complete absence of a vagina. Vaginal agenesis occurs in various disorders, the most common one is congenital conditions such as Mayer-Rokitansky-Küster-Hauser (MRKH) and Androgen Insensitivity Syndrome (AIS). Patients with vaginal agenesis usually have a normal female karyotype (46, XX) and are characterized by agenesis or aplasia of the uterus and upper part of the vagina (Abrar, Rizvi and Muhammad Zia-Ul-Islam, 2022).

Patients with vaginal agenesis have normal external genitalia appearance, reproductive endocrine function, and also normal signs of puberty. However, some patients with vaginal agenesis can be associated with extragenital malformation, mainly in the kidneys and skeleton (Herlin *et al.*, 2018).

The cause of vaginal agenesis remains unknown. It is believed that genetic factors, environmental and non-genetic factors, such as maternal diabetes, was one of the risk factor for this condition. MRKH itself consists of two types, which are MRKH type I (isolated or Rokitansky sequence) and MRKH type 2 (associated MURCS, i.e., Müllerian duct aplasia, renal dysplasia, and cervical somite anomalies). To establish the diagnosis of a MRKH, a clinical examination is required using

MRI, ultrasound, laparoscopy, and also pyelography (Ediati, 2016).

The treatment of vaginal agenesis consists of various surgical and non-surgical methods. The non-surgical technique basically aims to dilate the vagina manually. The various non-surgical techniques are the Frank method (by giving simple pressure to the vagina) or the Ingram technique (by giving pressure from a bicycle stool). Patients who are given dilators as their treatment are recommended to have regular sexual intercourse. However, surgical techniques are more commonly used, such as Davydov, McIndoe, Vecchietti, intestinal vaginoplasty, pudendal thigh flap, Malaga flap, or Williams techniques (Abrar, Rizvi and Muhammad Zia-Ul-Islam, 2022).

From these 2 types of treatment (surgical and non-surgical), each has its advantages and disadvantages (Abrar, Rizvi and Muhammad Zia-Ul-Islam, 2022). The treatment carried out aims to improve the quality of life of patients with vaginal agenesis. The parameters that can be measured in this case are the vaginal length and the patient's sexual satisfaction. This systematic review aims to describe the differences between surgical and non-surgical techniques of vaginal agenesis therapy in terms of vaginal length and sexual satisfaction.

METHOD AND ANALYSIS

The existing study was completed primarily based on the preferred Reporting objects for Systematic opinions and Meta-Analyses (PRISMA).

Protocol

Four researchers independently reviewed the titles and abstracts by collecting existing articles from screening and then checking for duplication. Articles with full text and in English are included in our review and screened separately with the four researchers. If there was a disagreement between the four researchers, the articles were re-reviewed together. All these steps are shown in the PRISMA diagram. Independently four researchers entered the extracted data into a template that consisted of the patient population, age at treatment, method (surgical or non-surgical), total vaginal length after treatment, and sexual function after treatment.

Eligibility Criteria

Inclusion and exclusion criteria are presented in Table 1.

Table 1. Inclusion and Exclusion Criteria for This Study

Characteristic	Inclusion	Exclusion
Population	Patients aged >18 years old with vaginal agenesis who are treated with surgical or non-surgical techniques.	Patients were associated with urogenital or anorectal anomalies, transgender women
Intervention	Vaginoplasty surgery or a non-surgical method	Patients who are not sexually active and currently suffering from gynecological illness
Comparator	Total vaginal length (TVL) and sexual function in patients with vaginal agenesis	Journals that didn't measure total vaginal length and sexual function in vaginal agenesis patient
Measuring result	Total vaginal length (TVL) that describe in centimeters and sexual function that describe in Female Sexual Function Index (FSFI) score and or patient's objective	TVL that didn't describe in centimeters and sexual function evaluation didn't using FSFI score and or patient's objective

Study design	Cross-sectional studies, observational studies, cohort studies, retrospective studies	Case series, case report, Randomized Control Trial (RCT)
Article language	English	Other languages
Date of publication	Published between 2018-2023	Published before 2018

Source: Processed Data by Researchers

Literature Review

Cross-sectional studies, observational studies, cohort studies, and retrospective studies were included in this study. Electronic databases such as PubMed, ScienceDirect, Cochrane Library, and SCOPUS have been used to search articles that were published between 2018-2023. A range of text words and indexed terms related to "total vaginal length", "sexual satisfaction", "re-surgery rate", "vaginal closure", "non-surgical method", "surgical method", "dilation", and "vaginal agenesis" will be searched.

The reference lists of studies meeting the inclusion criteria will be searched to identify additional relevant studies. A detailed search strategy and search term alternatives for each database are listed. Four researchers will screen references for eligibility independently. Study authors will be contacted to obtain relevant missing data if necessary and where resources allow. The risk of bias was assessed according to the type of studies. In this study was assessed using Newcastle-Ottawa Scale.

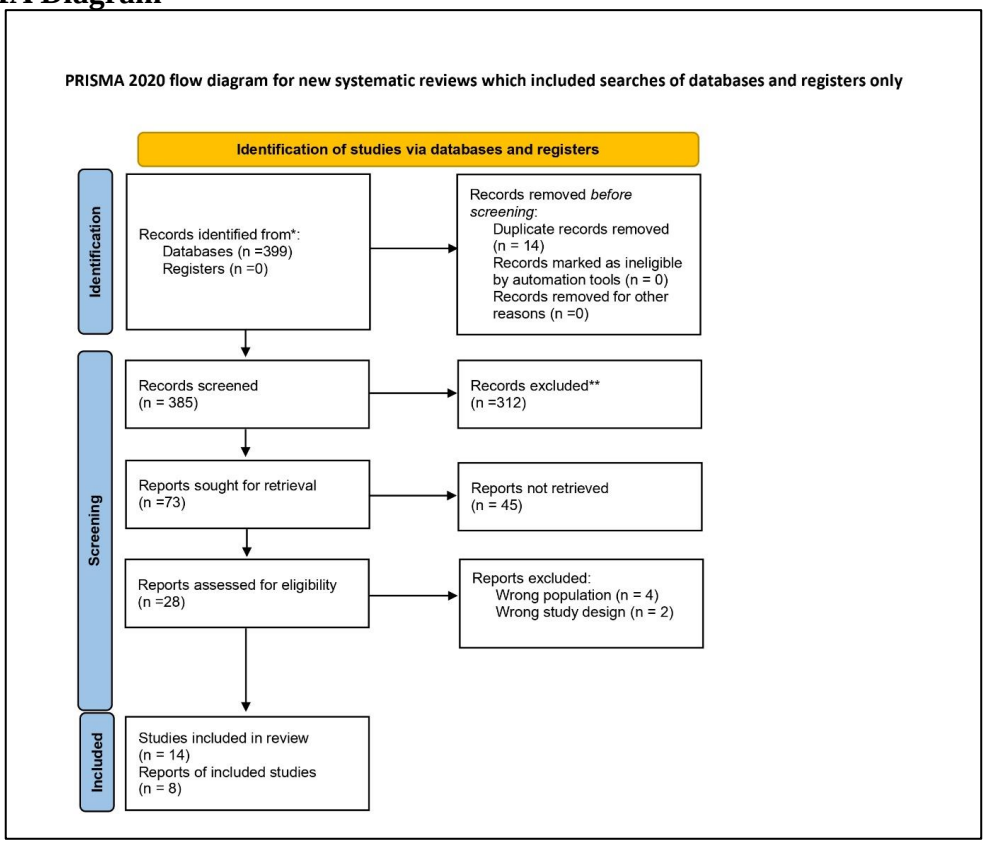
Quality of Assessment

Table 2. Newcastle-Ottawa Quality Assessment Scale

No.	First author, year	Selection				Comparability	Outcome		Total
		1	2	3	4		1	2	
1	Abrar, Rizvi and Muhammad Zia-Ul-Islam (2022)	*	*	*	**	**	**	*	10
2	Anagani *et al.*, (2020)	*	*	*	**	**	**	*	10
3	Cheikhelard *et al.* (2018)	*	*	*	**	**	**	*	10
4	Fernandes *et al.* (2022)	*	*	*	**	**	**	*	10
5	Herlin *et al.* (2018)	*	*	*	**	**	**	*	10
6	Kang *et al.* (2020)	*	*	*	**	**	**	*	10
7	Kılıççı (2020)	*	*	*	**	**	**	*	10
8	Fontoura Oliveira and Ferreira (2021)	*	*	*	**	**	*	*	9

Source: Processed Data by Researchers

PRISMA Diagram



Source: Processed Data by Researchers

RESULT

Non-surgical technique

Vaginal agenesis can be treated using two methods: non-surgical technique and surgical technique. The non-surgical technique is an effective and safer method to create a neovagina for vaginal agenesis patients. There is some technique for non-surgical therapy, such as self-dilation, coital dilation, hegar's dilator, etc. Three studies of non-surgical treatment for vaginal agenesis are included from the studies that have been collected. From that study, we found that the mean total vaginal length from non-surgical treatment was 7.23 cm. The average vaginal length ranges between 6-9 cm. Meanwhile, for sexual satisfaction, we used Female Sexual Function Index (FSFI) score with results 26 as the normal baseline score. A more excellent score on the FSFI index means greater levels of sexual function. If the score less than 26, it leads to sexual dysfunction. Two included studies evaluate sexual function using the FSFI score. The mean FSFI score in patients with non-surgical techniques was 24,40.

Surgical technique

There are some techniques for surgical therapy, such as the sigmoid technique, Davydov, Vecchietti, McIndo, Dupuytren, etc. From eight included studies, three articles present surgical and dilation methods then compare output after treatment. Two articles used a cross-sectional study, and one used a cohort study design. Five articles focus on surgical techniques only. Of the five articles, all presented total vaginal length data after treatment, but only one evaluated sexual satisfaction.

The mean total vaginal length in surgical treatment was 8,88 cm. All articles have good results for total vaginal length (>6 cm). There is one article that compares the vaginal length of several procedures.

The article stated that the longest vaginal length was obtained from the Mc Indoe technique is 12 cm.

The majority of sexual satisfaction data were obtained using the FSFI score, and there was one article that objectively stated the patient's opinion. The mean score of FSFI on surgical techniques was 25,23. Meanwhile, one article which described the results objectively stated that the patient was satisfied with the condition of her sexual life.

Table 3. Characteristics of The Included Studies

No.	Author	Study Design	Treatment / Method	Sample Size	Age	Mean Dilation TVL (cm)	Mean Surgery TVL (cm)	Mean Dilation Sexual Function	Mean Surgery Sexual Function
1	Cheikhelard *et al.* (2018)	Cross-sectional study	Dilation and surgery	109	> 18	9	10.69	24,7	26
2	Herlin *et al.* (2018)	Cohort, comparative study	Dilation and surgery	139	> 18	7.69	7.4	No data	No data
3	Kang *et al.* (2020)	Cross-sectional study	Dilation and surgery	133	> 18	6.5	8.1	24.49	23.79
4	Fernandes *et al.* (2022)	Observational study	Dilation	16	> 18	6,37	No data	No data	No data
5	Fontoura Oliveira and Ferreira (2021)	Retrospective study	Surgery	4	> 18	No data	10.5	No data	No data
6	Kılıççı (2020)	Retrospective study	Surgery	6	> 18	No data	9.2	No data	No data
7	Abrar, Rizvi and Muhammad Zia-Ul-Islam (2022)	Retrospective crossectional study	Surgery	14	> 18	No data	7.58	No data	Objectively: satisfied
8	Anagani *et al.*, (2020)	Retrospective study	Surgery	52	> 18	No data	8.4	No data	No data

Source: Processed Data by Researchers

DISCUSSION

This systematic review aims to describe the differences between surgical and non-surgical techniques of vaginal agenesis treatment in terms of vaginal length and sexual function. The studies that reported total vaginal length and sexual function after treatment within the year 2018 – 2023 were conducted. Therapy options for vaginal agenesis are diverse, both surgical and non-surgical. Nevertheless, instructing the patient to choose the suitable therapy for each individual is very important. According to our review, surgical therapy is performed more often and has slightly better results compared to non-surgical therapy.

Non-surgical therapy for vaginal agenesis is by dilation. The dilation itself can be either self-dilation or coital dilation. In Herlin *et al.* (2018) study, dilation therapy was considered a safe treatment choice because the therapy results were good, and there were no severe complications. However, the main problem

with dilation therapy is the risk of non-compliance. This therapy is very time-consuming and usually requires daily dilation for several months. The patient also complained about the discomfort, pain, and constant reminder of being different during the therapy.

In some patients, primary vaginal dilation utilizing dilators is the appropriate first-line approach in most patients because it is safer and more cost-effective. Primary vaginal dilation with dilatation is successful in approximately 90-96% of patients. Surgical techniques are only reserved for patients who have had no success with primary dilator therapy or prefer surgical techniques. Discussion regarding the selection of therapeutic techniques is carried out with careful consent and with individual gynecological treatment in mind. Surgical creation of the vagina requires postoperative dilatation or continued sex to maintain vaginal length and diameter. Therefore, surgery is not a method to avoid vaginal dilator therapy (Kurniawati, 2019).

According to research by Fernandes *et al.* (2022), non-surgical therapy for vaginal agenesis using dilators such as vaginal molds made by 3D printing is an excellent choice considering the good results and few complications that occur. Three-dimentional mold model devices can be offered as first-line therapy for vaginal agenesis, especially in developing countries or health services with limited professional specialization to carry out surgical therapy.

Our results confirm that total vaginal length and FSFI scores are similar in MRKH patients to the patients who had surgical or non-surgical treatment, although the surgical techniques had a bigger total vaginal length and FSFI score. Our results were concordant with those of previous studies (Cheikhelard *et al.*, 2018; Kang *et al.*, 2020).

Both surgical techniques and non-surgical techniques showed comparable outcomes in terms of improving the vaginal length and sexual function. These findings suggest that less invasive and non-surgical approaches like dilation can be effective alternatives for MRKH patients, providing similar benefits without surgery's associated risks and complications (Cheikhelard *et al.*, 2018). Surgical techniques for MRKH patients have shown positive outcomes in terms of vaginal length and sexual function. Various surgical interventions, including vaginoplasty and neovaginal reconstruction, reported those procedures resulted in improved vaginal length and enhanced sexual satisfaction for MRKH patients, contributing to their overall well-being and quality of life (Fontoura Oliveira and Ferreira, 2021). The previous study also mentioned that the best procedure in terms of fewer complications and best surgical outcome is yet to be determined (Abrar, Rizvi and Muhammad Zia-Ul-Islam, 2022).

Limitation

The limitations on this study are there were some missed articles that also published in 2018-2023 due to human error during screening process. However, we minimize this through screening that conducted by four authors and double checking on articles that included in this study. There were also limited access to several databases and there were many articles in foreign language besides English.

CONCLUSION

In terms of therapeutic results, surgical techniques give a slightly higher number in total vaginal length and sexual function than non-surgical techniques, but that does not conclude that surgical techniques are better. The disadvantage of non-surgical techniques is the need for consistency and high compliance in undergoing therapy because it was very time-consuming. Meanwhile, surgical therapy costs are more expensive and must be carried out by a professional specialist

doctor, and also proper wound care after therapy is needed to prevent further complications.

The appropriate therapy in patients with vaginal agenesis requires many factors and depends on each individual needs. The patients' ability to carry out therapy, the advantages and disadvantages of each type of therapy as well as the cost and availability of appropriate health services and qualified professional experts, also play an important role in determining the best therapy to be chosen.

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