

Clinical Characteristics of Patients Who Underwent Surgery for Genital Tract Malformations at Peking Union Medical College Hospital across 31 Years

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Abstract

Background: Female genital malformations represent miscellaneous deviations from normal anatomy. This study aimed to explore the clinical characteristics of patients who underwent surgery for genital tract malformations at Peking Union Medical College Hospital (PUMCH) during a 31-year period.

Methods: We retrospectively reviewed surgical cases of congenital malformation of the female genital tract at PUMCH for a 31-year period, analyzed the clinical characteristics of 1634 hospitalized patients, and investigated their general condition, diagnosis, and treatment process.

Results: The average patient age was 27.6 ± 9.9 years. The average ages of patients who underwent surgery for uterine malformation and vaginal malformation were 31.9 ± 8.8 years and 24.7 ± 9.0 years, respectively; these ages differed significantly ($P < 0.01$). Among patients with genital tract malformation, the percentages of vaginal malformation, uterine malformation, vulva malformation, cervical malformation, and other malformations were 43.9%, 43.5%, 7.4%, 2.3%, and 2.8%, respectively. Among patients with uterine malformation, 34.5% underwent surgery for the genital tract malformation, whereas in patients with vaginal malformation, the proportion is 70.6%; the difference between the two groups was statistically significant ($P < 0.01$). The percentage of complications of the urinary system in patients with vaginal malformations was 10.2%, which was statistically significantly higher than that (5.3%) in patients with uterine malformations ($P < 0.01$).

Conclusions: Compared to patients with uterine malformations, patients with vaginal malformations displayed more severe clinical symptoms, a younger surgical age, and a greater need for attention, early diagnosis, and treatment. Patients with genital tract malformations, particularly vaginal malformations, tend to have more complications of the urinary system and other malformations than patients with uterine malformations.

Key words: Clinical Characteristics; Female Genital Tract Malformations; Uterine Malformation; Vaginal Malformation

INTRODUCTION

Malformation of the female genital tract includes congenital developmental malformation of the uterus, cervix uteri, vagina, and oviduct, and it is usually complicated by malformations of the urinary system, skeleton, and other systems. The primary manifestations include amenorrhea, infertility, recurrent abortion, and premature delivery, which have a strong impact on physical and psychological health of patients.^[1,2] However, few studies involving a large sample of epidemiological data have been conducted due to the low morbidity of this condition. Because Peking Union Medical College Hospital (PUMCH) is a diagnostic and

treatment center for genital tract malformation in China, this study retrospectively analyzed the clinical data of female inpatients with congenital malformation of the genital tract during a period of 31 years. We discussed the characteristics of inpatients with genital tract malformations to provide a

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basis for an epidemiological study and to improve the clinical diagnosis and treatment of congenital malformations of the genital tract.

METHODS

Patients

We obtained the data of female patients who were hospitalized during a 31-year period (January 1, 1983–December 31, 2014) and diagnosed with a congenital malformation of the genital tract by screening the medical records of PUMCH. We found a total of 2320 patients who were diagnosed by ultrasound and physical examination by the American Fertility Society (AFS) standard; after eliminating patients who were hospitalized due to other system-related diseases, 1790 cases remained. We then removed the re-admitted patients, and 1634 cases remained. Malformation of multiple organs in the genital tract was the principal diagnosis and reason for surgery.

Statistical analysis

We performed a descriptive statistical analysis, adopted a rate to express enumeration data, and expressed measurement data as the mean \pm standard deviation (SD). We used SPSS software version 21.0 (IBM, USA) to conduct the statistical analysis. *t*-test and Chi-square test were used to analyze the data. The statistical significance threshold was set at $P < 0.05$.

RESULTS

Operative age of the 1634 patients

The average age of the 1634 patients was 27.6 ± 9.9 years, and 1% of the patients were 0–10 years old; 22% were 11–20 years old; 50% were 21–30 years old; 21% were 31–40 years old; and 6% were older than 40 years [Figure 1]. The average ages of the patients with uterine malformations and vaginal malformations were 31.9 ± 8.8 years and 24.7 ± 9.0 years, respectively; these ages were statistically significantly different ($t = 18.328$, $P < 0.01$).

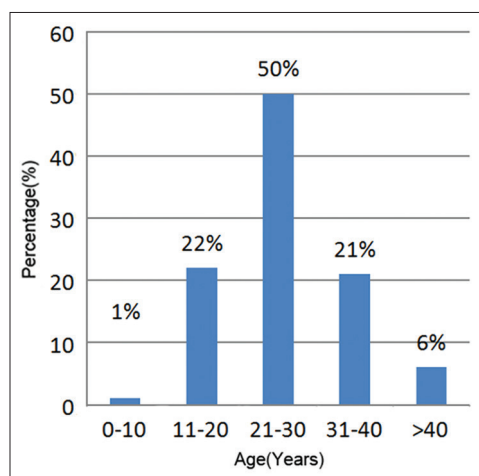


Figure 1: Age distribution of patients who underwent surgery for genital tract malformations.

Proportion of various malformations and distribution over time

We found 1634 unique cases of congenital malformations of the genital tract at PUMCH during a 31-year period, and the percentages of vaginal malformation, uterine malformation, vulva malformation, cervical malformation, and other malformations were 43.9% (718 cases), 43.5% (711 cases), 7.4% (121 cases), 2.3% (38 cases), and 2.8% (46 cases), respectively. The various malformations and their distributions over time are shown in graph [Figure 2].

Among the cases of vaginal malformation, the three most common diagnoses were Mayer-Rokitansky-Kuster-Hauser (MRKH) syndrome (322 cases, 44.8%), Herlyn-Werner-Wunderlich syndrome (HWWS, 133 cases, 18.5%), and vaginal atresia (103 cases, 14.3%). In inpatients with uterine malformation, the three most common diagnoses were septate uterus (382 cases, 53.7%), didelphys (87 cases, 12.2%), and bicornuate uterus (65 cases, 9.1%).

Distribution of reasons for admission

In 718 patients with vaginal malformations, 70.6% underwent surgery for genital tract malformations and only 29.4% underwent surgery due to other obstetrical or gynecological diseases. In contrast, in 711 patients with uterine malformations, the percentage of patients underwent surgery for the genital tract malformation as the primary diagnosis was 34.5%, whereas that of patients who underwent surgery for other diseases was 65.5%. A statistically significant difference was observed between the two groups ($\chi^2 = 264.5$, $P < 0.01$) [Table 1].

The three diagnoses with the highest operability among uterine malformation patients were septate uterus, rudimentary horn of the uterus, and arcuate uterus. The three diagnoses with the highest operability among vaginal malformation patients were congenital absence of a vagina, vaginal atresia, and HWWS.

Association of genital tract malformations with other system malformations

Of all patients with a genital tract malformation, 129 (7.9%) had urinary system malformations, 17 (1.0%) exhibited

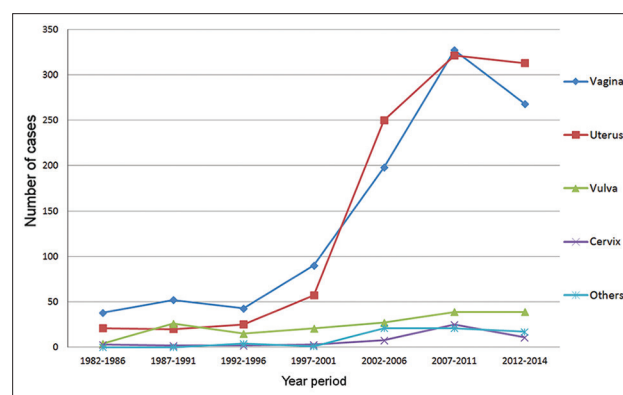


Figure 2: Proportion of various malformations and distribution in patients who underwent surgery for genital tract malformations over a 31-year period.

Table 1: Proportion of malformations and distributions in patients who underwent surgery for genital tract malformations (n=1429)

Malformations	Patients who underwent surgery for tract malformation (n = 752)	Patients who underwent surgery for other diseases (n = 677)	Total (n)	χ^2	P
Uterine malformation, n (%)	245 (34.5)	466 (65.5)	711	264.5	<0.01
Vaginal malformation, n (%)	507 (70.6)	211 (29.4)	718		

a skeletal deformity, and 13 (0.8%) had a cardiovascular malformation. Among the patients with vaginal malformation, 73 (10.2%) were complicated by the urinary system malformation, and most were MRKH (12.7%) and HWWS (35.6%); and in patients with uterine malformation, 38 (5.3%) were complicated by the urinary system malformation. A statistically significant difference was observed between the groups ($\chi^2 = 11.972$, $P < 0.01$).

DISCUSSION

Malformation of the female genital tract includes congenital developmental malformation and dysfunction of the uterus, cervix uteri, vagina, and oviduct. These malformations are epidemiologically significant, and their clinical diagnosis and treatment must be improved.

The study indicated that the average age of the patients was 27.6 ± 9.9 years, and the average ages of patients who underwent surgery for uterine malformations and vaginal malformations were 31.9 ± 8.8 years and 24.7 ± 9.0 years, respectively. The patients with vaginal malformations who received surgery were much younger ($P < 0.01$). This finding indicates that compared to patients with uterine malformations, patients with vaginal malformations exhibit an earlier age of onset and more severe clinical symptoms in our institute. A previous study suggested that more than half of the patients with congenital vaginal malformation had pelvic endometriosis that makes people suffer a lot.^[3] Hence, they require early diagnosis and treatment by a gynecologist to reduce secondary complications.

Due to the distribution of genital tract malformation diagnoses, detailed data are limited. The AFS guide indicates that the overwhelming majority of patients have a uterine malformation.^[4] It was reported that the proportion of uterine malformations among all genital tract malformations was as high as 76.9%.^[5] However, this study found that the percentages of inpatients with vaginal malformations and uterine malformations were 43.9% and 43.5%, respectively, of all inpatients with genital tract malformations. No significant increase or decrease was noted across the 31-year period, and the number of patients in the two groups was almost equal. This phenomenon is related to the diagnosis and treatment performed at the hospital. The diagnosis and treatment of uterine malformations is relatively unequivocal, and hysteroscopy is the primary treatment. Because the hysteroscope technique is popular in China, surgeries for uterine malformation are mostly performed in primary hospitals. However, the distribution and literature reports

vary due to the differing occurrence rates, complex symptom expression of vaginal malformations, and large number of patients transferred to our hospital.

Of the patients with vaginal malformations, most (70.6%) were hospitalized to receive vaginal malformation-related surgeries, such as artificial vaginoplasty and oblique vaginal and septum excision. In contrast, the surgeries received by most of the patients (65.5%) with uterine malformations had no obvious correlation with uterine malformation, and only 34.5% of the patients received transcervical resection of the uterine septum, rudimentary uterine horn excision, and other uterine malformation-related surgeries for uterine malformation. Based on the analysis, it was found that a statistically significant difference ($P < 0.01$) exists between the two patient populations; the greatest proportion of patients with vaginal malformations had MRKH syndrome (44.8%), HWWS (18.5%), or congenital atresia of the vagina (14.3%). HWWS and congenital atresia of the vagina cause genital tract obstruction accompanied by abdominal pain and amenorrhea; therefore, both the treatment time and demand are important. We found that the greatest proportion of patients with uterine malformations had septate uterus (53.7%), didelphys (12.2%), or bicornuate uterus (9.1%). Previous studies and the statistical analysis of Puscheck and Cohen also indicate that septate uterus (19.8%), arcuate uterus (19.1%), and bicornuate uterus (11.6%) have the highest morbidity among uterine malformations.^[6] Uterine malformation does not cause obstruction; therefore, it lacks typical clinical symptoms, resulting in a low clinical outpatient rate. Some patients with a uterine malformation such as septate uterus or bicornuate uterus are still able to undergo pregnancy and delivery,^[7-9] which explains why patients with uterine malformations receive surgery at an older age.

Congenital malformations of the female genital tract are often complicated by malformation of other systems including the urinary system, skeletal system, and cardiovascular system. Previous studies have reported a 55%–70% incidence of genital tract anomalies in patients with unilateral renal agenesis.^[10] In this study, the morbidity of urinary system malformation, which is the most common type of complication, among the patients with a genital tract malformation was 7.8%. The proportion of skeletal malformations was smaller, and cardiovascular malformations were even rarer. A statistically significant difference ($P < 0.01$) exists for the number of patients with urinary system complications between the vaginal malformations and the uterine malformations groups; thus, enhanced evaluation of the urinary system

and other systems should be conducted during the diagnosis and treatment of patients with vaginal malformations. Adult females with suspected genital tract malformations should receive routine urological ultrasonic testing and spine plain film examinations.

Domestic and international epidemiological correlational studies of congenital malformations of the female genital tract lack large sample sizes and disaggregated classifications. We utilized a relatively large sample size in this analysis, which included more than 1000 cases of genital tract malformations at a single hospital. To the best of our knowledge, this is the largest established database to date. However, limitations of this retrospective analysis include the restricted use of inpatient sample data, and the proportion of each disease reflected by hospital characteristics does not represent the true morbidity of the population. It is necessary to conduct an epidemiological study of the general population to determine the morbidity and characteristics of the Chinese female population with genital tract malformations.

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Conflicts of interest

There are no conflicts of interest.

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