Journal of Pediatric Urology (2014) 10, 1160–1164

Journal of Pediatric urology

Urogenital function after cloacal reconstruction, two techniques evaluated

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Received 2 March 2014; accepted 21 April 2014
Available online 7 June 2014

KEYWORDS
Cloacal malformations;
Urological function;
Gynecological function;
Urogenital mobilization

Abstract *Objective:* Current surgical techniques for cloacal reconstruction are posterior sagittal anorecto vagino urethroplasty (PSARVUP) and posterior sagittal anorectoplasty (PSARP) with total urogenital mobilization (TUM). The aim of this study was to explore the results of reconstructive cloaca surgery in the Netherlands and evaluate urogenital function after PSARVUP and TUM.
Patients and methods: Medical records from five pediatric surgical departments in the Netherlands were studied for patients with cloacal malformations treated between 1985 and 2009. Forty-two patients were eligible, and patients with short common channels were categorized into PSARVUP and TUM groups. Groups were compared using Fisher's exact test.

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http://dx.doi.org/10.1016/j.jpurol.2014.04.018

Results: Median age at time of surgery was 9 months (range 1—121). In 24 patients (57%) a PSARVUP was done, in 18 patients (43%) TUM. Median follow-up was 142 months (range 15—289). At follow-up spontaneous voiding was seen in 29 patients (69%). Clean intermittent catheterization (CIC) was needed in 14 patients (33%); a urinary diversion was created in 10 patients (24%). In total 32 patients (76%) were dry with no involuntary loss of urine per urethra. Recurrent urinary tract infections were seen in 23 patients (55%). When comparing PSARVUP and TUM groups in our series of patients with short common channels, there were no differences in urological outcome. Normal menstruation was present in 11 of the 20 patients who reached puberty (55%).
Conclusion: Urogenital functional outcome after reconstructive surgery for cloacal malformations was similar in PSARVUP and TUM groups in patients with short common channels. A thorough urological follow-up is needed to establish the long-term bladder function and urinary incontinence results to prevent long-term risks of recurrent UTI. Albeit without differences between PSARVUP and TUM groups, 45% of the patients present with abnormal or absent menstruations. Gynecological follow-up is mandatory in all patients with cloacal malformations 6 months after the first sign of puberty.

Introduction

In females the most complex anorectal malformation is a cloacal malformation, in which the rectum, vagina, and urethra drain into one common channel [1]. The current approach for surgical correction of the cloaca is based on the posterior sagittal approach as proposed by Peña in 1982 [2]. This technique was then modified to the posterior sagittal anorecto vagino urethroplasty (PSARVUP) for cloacal malformations in particular [3]. In 1997 the total urogenital mobilization (TUM) was introduced as a novel technique for the reconstruction of cloacas, leading to decreased operation time and improved cosmetic results [4]. Currently, TUM is first choice of surgery in many clinics, particularly in patients with cloacas with limited length of common channel (less than 3 cm) [5]. Patients with short common channel cloacas generally have better long-term functional outcome than patients with long common channels [5]. However, it is suggested that extensive mobilization of the urethra, bladder neck, and vagina in the TUM operation may lead to impaired urogenital function [6—8]. To date reports of large cohorts comparing PSARVUP with TUM have not been published. With this study we reviewed the patients with cloacal malformations of the past 25 years in the major pediatric surgical centers in the Netherlands. Patients with short common channels who underwent TUM were compared with patients who were operated on by PSARVUP. The aim of the study was to describe and assess the risk of long-term urogenital disturbances as a consequence of TUM and PSARVUP surgeries.

Materials and methods

Medical records from five pediatric surgical departments in the Netherlands were studied for patients with a cloacal malformation treated between 1985 and 2009. Fifty-five patients were identified, of whom 13 (5 TUM, 4 PSARVUP, 4 missing data regarding surgical approach) were subsequently excluded because of young age or lack of completeness of the data. All patients with a cloacal malformation had a structured work-up including a cardiac and renal ultrasound, voiding cysto-urethrogram or urodynamic study, sacral X-ray and spinal ultrasound according to the national consensus in the Netherlands. After approval from the institutions' ethical committees, medical records were reviewed for information including associated anomalies, surgical approaches, complications, and functional outcome at latest follow-up. Surgical approaches were either posterior sagittal anorecto vagino urethroplasty (PSARVUP), in which the urogenital sinus is separated in vaginal or urethral tissue, or posterior sagittal anorectoplasty (PSARP) with total urogenital mobilization (TUM), in which the urogenital sinus is mobilized *en bloc* to reach the perineum [2,4]. As this study was a retrospective analysis, choice of surgical technique mainly depended on patient details (length of common channel as measured during preoperative cystoscopy), preference of the surgeon, and for older cases, lack of other available techniques. Surgical complications and colorectal outcome were reported elsewhere [9]. In this study urological and gynecological aspects are reported. The outcome criteria for urological function were spontaneous voiding, need for intermittent catheterization, presence of a urinary diversion, urinary incontinence (urethral loss of urine), recurrent urinary tract infections (UTI), and need for kidney transplantations. Urinary diversions were either a continent diversion with a catheterizable Mitrofanoff channel or an incontinent vesicostomy. Recurrent urinary tract infections were defined as more than three infections per year. Menstrual status and pregnancies served as outcome measures for gynecological function in the patients who reached puberty. As both PSARVUP and TUM were widely used in the patients with short common channels, outcome after each type of surgery was compared for this group of patients using Fisher's exact test for group comparison.

Results

Forty-two charts were included for this review. Information regarding length of common channel was retrievable from the medical chart in 25 patients (59%). Mean length of the common channel was 2.2 cm (range 1.0—4.0 cm). Nineteen