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Features of the Genitourinary System in Anorectal Malformations in Children

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Annotation. In anorectal anomalies, combined malformations of the urogenital system are often observed [1,5,7]. This can be explained by the close relationship between the embryonic development of these organs and systems. It is no coincidence that a lot of attention in the literature of the last decade is paid to urological problems of anorectal anomalies [12,15,20]. However, the true frequency has not yet been established and the structure of pathological conditions of urogenital system in anorectal anomalies has not been fully studied, the consequences of their delayed diagnosis have not been analyzed, treatment and tactical and operative technical aspects have not been developed and the organizational side of the issue needs improvement.

Key words. Pathology, rehabilitation of children, anorectal malformations in children.

Introduction. In the last 20 years 196 children aged from 1 day to 14 years old with various variants of anorectal anomalies were under our observation. Most of them had been previously operated in other medical institutions. Concomitant congenital lesions of the urogenital system were detected in 91 patients (46%). There were 51 boys and 40 girls.

During the first period of the study, when the urological examination was made only if there were signs of the urinary dysfunction, the concomitant diseases were revealed in 44 (27%) out of 134 patients. In the second period of work, during the purposeful examination of 62 patients, concomitant lesions of the urogenital system were found in 47 (77%), i.e., more than 2 times more often. Thus, a significant proportion of severe comorbidities were not manifested in any way, and neither the doctors who observed the patients, nor, moreover, the parents knew about them, although these children were repeatedly admitted to surgical hospitals.

The nature of the detected pathological processes is shown in Table 1. Often, they are combined multiple, so the total number of nosological units significantly exceeds the number of patients [16,21].

The variety of concomitant pathological processes necessitates their systematization, which is important from the scientific and practical points of view.

We have developed the following classification of pathological processes.

By genesis

- congenital
- postnatal
-Combined
-Iatrogenic

By essence

-Organic
-Functional

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-Infectious-inflammatory
-Combined

By localization

-Upper urinary tract
-Lower urinary tract
-Genital, Combined

Table 1.

Nature of concomitant pathological processes in patients with anorectal anomalies

	Associated pathological process	Number of patients
Malformations of the upper urinary tract (48 patients)	Renal aplasia	10
	Congenital hydronephrosis	8
Lower urinary tract lesions (53 patients)	Ureterohydronephrosis	8
	Renal dystopia	7
	Hypoplasia of the kidney with secondary wrinkling	5
	Doubling of the kidney and ureter	3
	Retrocaval ureter	3
	Ureteral ectopy into the urethra	2
	Ureterocele	2
	Vesico-renal reflux	11
Genital malformations (16 patients)	Neurogenic bladder	5
	Bladder stones	3
	Urethrorectal fistula	25
	Urethral stenosis	4
	Doubling	3
	Diverticulum	2
	Hypospadias	8
	Congenital cloaca	5
	Cryptorchidism	3
Urinary tract infection (93 patients)	Pyelonephritis	27
	Cystitis	31
	Vulvovaginitis	35

Subdivision of pathological conditions according to their genesis, essence and localization helps to understand many nuances associated with the study of these conditions, their diagnosis and treatment of patients. Congenital concomitant pathological processes of organic nature in the form of various anomalies of the urogenital system in our observations took the leading place [2, 13]. The most severe group consisted of patients with upper urinary tract malformations, including combined ones [17, 19]. The analysis shows that often a doctor during initial and subsequent examinations is satisfied with the diagnosis of anorectal anomaly (in particular, atresia of the anus) and forgets about the need to search for combined malformations of the urinary system [4,10,]. As a result, most of them remain unrecognized or are diagnosed long overdue, resulting in severe progressive structural and functional changes up to chronic renal failure[8,14,16].

According to our data, concomitant malformations of the urogenital system in anorectal anomalies occur twice as often in boys than in girls. Out of 69 male patients observed, they were revealed in 46 (66%), whereas in female patients, concomitant abnormalities were found in 30% of observations. To some extent,

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this can be explained by the predominance of high atresia forms in boys. The latter were present in 109 observations, and low ones in 77 cases.

In high (supralevator) forms of anorectal anomalies, concomitant defects of the urogenital tract were found in 60% of observations, with boys accounting for 73% and girls for 43%. In low (translevator) forms, 20% of concomitant lesions of the urogenital tract were found.

High forms of anorectal anomalies are characterized not only by a significantly higher frequency of associated lesions, but also by their severity [18]. The combination of anorectal anomalies with urinary tract lesions requires a differentiated approach to the choice of the sequence, timing, and methods of surgical intervention [3,9]. Initially, we sought to perform staged corrective surgeries depending on the severity of one or another process. Recently, we have accumulated experience in simultaneous correction of combined malformations, for example, abdominal-perineal proctoplasty with plasty of the pyeloureteral segment in hydronephrosis, nephrectomy, excision of ureterocele.

Congenital cloaca deserves a special mention: in this case we have to solve proctological, urological and gynecological problems. Our experience proves that it is quite justified to shift the terms of correction of this severe disease to an early age.

A total of 11 children underwent simultaneous correction of anorectal and urogenital anomalies. Satisfactory results were obtained in all cases.

Postnatal concomitant pathological processes included mainly infectious-inflammatory lesions of the urinary tract and genitals. Pyelonephritis, cystitis, vulvovaginitis are common "companions" of anorectal anomalies. Their persistent, progressive nature often becomes dominant in the overall picture of the disease, which is due to the presence of an obstructive factor, exacerbated by constant infection of the urogenital tract in fistulous forms of atresia. Infectious and inflammatory complications require close attention at all stages of treatment, with more attention paid to pyelonephritis, which cannot be said about genital infections in girls. Meanwhile, there is their high susceptibility to microbial pathogens, which contributes to the anatomo-physiological features. The epithelium of the vulva is tender and easily injured, the vagina of children lined with a delicate and thin mucous membrane, there is no normal flora in it, the immune properties of the vagina are reduced. Against this background, the infection of the girls' genitals creates quite difficult problems, contributes to festering of wounds and divergence of sutures with recurrent fistulas. Persistent infection persists for a long time even after radical surgery, if targeted therapy is not carried out.

We took vaginal smears from the observed patients to determine leukocytes and microflora and to perform colpocytological examination. As a rule, many leukocytes and cocci were found, and colpocytograms showed intermediate parabasal and basal cells.

To ensure a favorable course of the postoperative period, measures were taken to eliminate or reduce inflammatory changes in the genital tract, which included washing with furacilin solution, introduction of synthomycin emulsion into the vagina, vaginal sticks with sulfonamide preparations. At the end of the operation, and then from 2 to 7-8 days, folliculin with vegetable oil was injected into the vagina to improve the conditions of mucosal healing. The control was carried out by colpocytological examinations. More rapid clearing of the wound and significant acceleration of regeneration processes were noted: from the 6-8 days after the operation, cocci disappeared in vaginal smears, the number of superficial and intermediate cells increased. In all observations (98 operations for rectovaginal and rectovaginal fistulas) we obtained favorable results, there were no relapses.

Iatrogenic pathological processes occur as a result of errors in the performance of primary proctoplasty: urethral wounds, damage of nerves innervating the bladder. Among the patients of this group we studied, 25 boys had urethrorectal fistulas, 4 boys had urethral stenosis, and 2 boys had diverticula in the place of the eliminated fistula with the presence of stone in the diverticulum. Out of 31 patients in 19 patients the process was combined with the presence of severe upper urinary tract malformations, pyelonephritis and cystitis. In such a situation the therapeutic and tactical tasks become much more complicated. Nevertheless, the elimination of intraurethral or urethral obstruction is an urgent task of paramount importance.

Surgical correction of iatrogenic urethral deformities is complex. Preoperative preparation requires special attention in view of severe secondary changes caused by a combined urological pathological process and chronic intoxication. Often it is necessary to apply a preventive unnatural anus. Great technical difficulties for the surgeon are created by the local state of the tissues, as a rule, scarred and altered.

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The immediate results of the surgeries we performed are presented in Table 2. Recurrence of the disease was observed in 2 cases. Both children were operated on repeatedly with a favorable result.

Long-term results within 1 to 10 years were traced in all patients.

Table 2. Results of repeated urethral interventions

Access and type of urethral plasty	Number of patients	The result of the operation	
		The fistula has been repaired	Fistula recurrence
Prosthetic:			
Holtzoff plasty	6	6	0
Suturing of the defect in the urethral wall	12	11	1
Abdominal-perineal intrarectal:			
Without suturing the defect in the urethral wall	6	5	1
With suturing of the defect	5	5	0
Total..	29	27	2

Twelve children had urinary incontinence of varying severity and duration. While in 7 cases this phenomenon was temporary and disappeared after targeted treatment of urinary tract infection, 5 patients suffered from persistent incontinence due to bladder innervation disorders.

Conclusions

1. In anorectal anomalies, concomitant malformations of the urogenital system (predominantly of the upper urinary tract) are observed in 44% of children, mainly in high forms of anus atresia.
2. Along with the congenital concomitant pathological processes, infectious and inflammatory lesions of the urinary tract and genitals, cystitis, vulvovaginitis and pyelonephritis are observed in half of the cases.
3. Diagnostic and treatment program in such patients is a complex task and requires the participation of highly qualified specialists of different profiles, so patients should be hospitalized only in specialized centers.

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