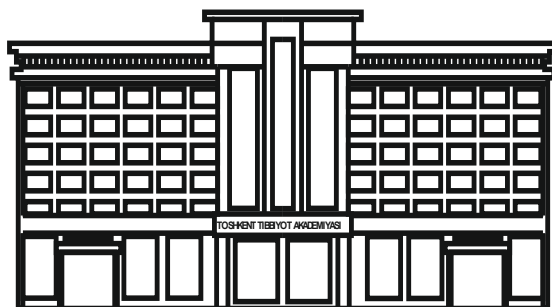


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Materials and Methods. Literature from 2019–2024 was sourced from PubMed, IEEE Xplore, and Scopus, using terms like “AI bioprinting optimization,” “heart tissue engineering,” and “cardiac scaffolds.” From 120 articles, 11 were selected based on AI-driven parameter studies (e.g., extrusion pressure, bioink viscosity). Inclusion focused on machine learning (ML) and deep learning applications in extrusion and inkjet bioprinting, analyzing bioinks (e.g., collagen, alginate) and outcomes (e.g., cell survival, mechanical properties). Exclusion omitted non-peer-reviewed works or non-cardiac studies. Data were qualitatively synthesized, categorizing AI techniques, parameter adjustments, and validation metrics, cross-checked with seminal works for reliability.

Results. AI enhances bioprinting efficacy: ML predicts optimal pressure (20–50 kPa), achieving >90% cardiomyocyte viability vs. 70% manually [2]. Deep learning improves porosity by 25% and reduces shear stress by 30%, enhancing vascularization and alignment. AI-optimized bioinks (e.g., collagen) yield constructs with 0.5–1 mN/mm² contractility, nearing native tissue (1–2 mN/mm²). Limitations include dataset bias and lack of in vivo data.

Conclusions. AI-driven optimization significantly refines bioprinting for heart tissue, achieving >90% cell viability, 25% porosity gains, and contractility (0.5–1 mN/mm²) close to native myocardium through precise parameter tuning (e.g., 20–50 kPa pressure, 10–30 mm/s speed). This addresses CVD’s global burden (17.9M deaths/year) by advancing scalable cardiac solutions [1]. However, biases in small datasets and short-term focus (weeks–months) limit generalizability and long-term insights. Future research should leverage large, standardized datasets for robust ML models, conduct longitudinal studies (>1 year) to assess durability, and integrate real-time AI control to minimize cell damage. Exploring hybrid bioinks and patient-specific models via AI could further enhance functionality, pushing bioprinting toward clinical reality and reducing heart disease’s socioeconomic toll.

FUNCTIONAL STATE OF THE COLON AFTER ITS RESECTION IN HIRSCHSPRUNG’S DISEASE

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Introduction. The problem of diagnosis and treatment of children with Hirschsprung’s disease is still relevant in pediatric surgery. This is due to various complications that occur after the initial radical surgery.

Aim. To evaluate the long-term results of surgical treatment of Hirschsprung’s disease in children.

Materials and methods. The study is based on the results of an analysis of a comprehensive examination and surgical treatment of 86 children with Hirschsprung’s disease aged 1 month to 16 years who were in the ASMI pediatric surgery clinic from 2005 to 2024. There were 61 boys and 25 girls. All patients were examined according to standards including medical history collection, evaluation of the effectiveness of conservative treatment, comprehensive examination included: laboratory diagnostic methods (general blood, urine, coprogram, intestinal microflora examination), biochemical blood tests, colonofibroscope, radiopaque irrigography, ultrasound (ultrasound), rectoanal reflex examination, histomorphological biopsy examination taken during colon segment surgery.

Results. Correction of the defect was performed using the Soave-Lenyushkin method. In 7 newborns who were admitted with an acute form with intestinal obstruction, surgical correction of the defect began with the formation of a colostomy. The radical surgery was performed 6 months after the colostomy. The state of physical psychoemotional development, as well as anthropometric indicators, were studied in the long term. One patient was diagnosed with Down syndrome as a concomitant disease. Of the 86 operated children, 84 cases had a smooth postoperative course, 2 (2.3%) patients had an intercutaneous abscess in the immediate postoperative period and one patient developed necrosis of the reduced colon, which was located outside the anus. The preserved viable intestine was located outside the anus. The preserved viable intestine was fixed to the perianal skin with additional sutures. not observed. All 86 patients underwent surgery using the Soave-Lenyushkin method. An analysis of the long-term results of surgery in the period from 1 to 8 years showed that among the patients we examined, 75 cases (87.2%) had good results, and 11 cases (12.8%) had satisfactory results. Conservative therapy with drugs that improve microcirculation and topical application of ointment dressings gave a positive result. The proportion of good results in our observations increased with the lengthening of the time after surgery. Catamnestic observations and surveys conducted in children at an older age showed that they also had functional disorders of varying severity for a certain period of time, these children up to 12 months had more frequent stools, up to 3–5 times a day, and fecal masses were mushy, which disappeared gradually. Long-term rehabilitation measures aimed at normalizing the reserve function of the rectal ampoule accelerate the processes of its adaptation.

Conclusion. Using modern methods of treatment and rehabilitation in children with various forms of Hirschsprung’s disease after Soave-Lenyushkin surgery, it was possible to avoid disability of children, long-term after surgery there is a noticeable positive trend in functional results, which ends by 2 years after surgery.

THE RECURRENCE RATE OF EXTERNAL GENITAL ENDOMETRIOSIS.

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Endometriosis is considered one of the most common and yet mysterious gynecological diseases in women of reproductive age [1,3]. Despite the fact that the disease is diagnosed quite frequently (according to statistical data, up to 30% of women of reproductive age suffer from endometriosis), answers to questions such as the pathogen-

ic mechanism of the disease development, the most effective treatment methods, how to detect the condition at an early stage, and whether there are preventive measures for the recurrence of external genital endometriosis (EGE) [4,16] have yet to be found.

The aim of the study: is to improve the early diagnosis of external genital endometriosis by identifying risk factors for recurrence after surgical treatment.

Materials and Methods: A comparative clinical analysis was conducted on the examination and treatment outcomes of 50 patients with external genital endometriosis (EGE) who underwent surgery at the Department of Operative Gynecology of the private clinic "Profmedmax" in Karshi between 2022 and 2024. All patients were divided into two groups based on the presence or absence of disease recurrence during an 18 to 36-month follow-up period. Group I consisted of 78 patients without endometriosis recurrence; Group II included 22 patients with endometriosis recurrence, as confirmed by gynecological examination, ultrasound (US), magnetic resonance imaging (MRI), and verified through repeat laparoscopy with histological examination in 20 patients. The remaining two patients were not subjected to repeat surgical treatment due to low ovarian reserve and were referred for consultation with reproductive specialists.

Research Results: All patients were of reproductive age (18-42 years). The average age of patients with endometriosis (EGE) was 31 ± 6.0 years. When analyzing the age parameter, it was found that the frequency of EGE recurrences was higher in the group of women aged 26-30 years. The main complaint of patients with EGE was pain syndrome, with the most frequent being dysmenorrhea (80.0% of patients). Chronic pelvic pain (unrelated to menstruation) was observed in 78.0% of patients, with this symptom being significantly more common in patients with EGE recurrence than in those without recurrence ($p=0.01$). Moreover, pain radiation to the sacrum occurred in 40.0% of cases, and dyspareunia in 27.0%.

An analysis of pain intensity in EGE patients revealed that patients in group II more often reported severe pain (90.9% of women) compared to patients in group I (65.4% of patients) ($p=0.05$). Menstrual dysfunction in the form of menorrhagia was noted in 29.0% of patients, and metrorrhagia in 10.0%. It is worth mentioning that patients in group II had a significantly higher incidence of spontaneous miscarriages in their medical history (31.8%) compared to group I (8.9%) ($p<0.05$).

Conclusions: The recurrence rate of external genital endometriosis after surgical treatment during a 3-year follow-up period is 22.0%, with the majority of recurrences (90.9%) being diagnosed within the first two years after the completion of treatment. The likelihood of recurrences of external genital endometriosis significantly decreases when hormonal therapy with dienogest and goserelin is administered in the postoperative period.

DIAGNOSIS OF NEPHROLITHIASIS AND PRACTICAL RECOMMENDATIONS FOR OPTIMIZING TREATMENT.

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Importance of theme, as you know, Uzbekistan is considered to be endemic centre of urine stone disease. According to last data about urine stone disease, 30-40 percentage of children who were cured in urological department infected with this disease. Even though this illness was not learned in children. So it is very important to learn specific features of clinical manifestation and surgical treatment of this illness in endemic furnace conditions for medical practice. In the next years, works which were done to cure bilateral nephrolithiasis did not solve many problems, till now those are being reason for arguments. This in turn is due to the fact that the disease is accompanied by many and painful complications in children, in other words calculose pyelonephritis, calculose hydronephrosis and as a complication of these – chronic kidney failure and anemia. Shown facts mean, bilateral nephrolithiasis in children it is required to choose most appropriate surgical tactics in every single individual condition. Therefore, main treatment way remains the surgical method in children who is infected with this disease. There is no specific criteria for determining types and sequences of operation depending on location, size, amount of stones in kidneys as well as type of complications and leveln of disease. Hence, it is essential to find the most rational surgical tactics for treatment of bilateral nephrolithiasis in children.

Object of research, based on Andijan region children's multidisciplinary in the Urology Department of Medical Center for the next years lying with the diagnosis of bilateral nephrolithiasis in children 40 patients treated to the results of examination of children.

Conclusion Bilateral nephrothiasis in children most occurs in heavy form. For example, with many stones in calyx and renal pelvis (75%) with coralline stones (58%) as well as a lot in the urinary tracts with stones located in places (32.3%). Most common and most severe complications of bilateral nephrolithiasis in children are as follows: calculous pyelonephritis (100%) calculous hydronephrosis (83.3%) chronic kidney failure (62.1%) anemia (37%). When bilateral nephrolithiasis is operativ treated, it has to be chosen individually by considering side, size, method and multilevel of initial operation, character, localization of stone, structure of renal pelvis, existence and their severe level of complications. Bilateral nephrolithiasis in children has to be treated by one-step operation in the following cases: localization of one or more stones in renal pelvis or calyx, coralloid with first stage of one or both kidneys stones. In the clinic during nephrolithotomy and pyelolithotomy to temporarily stop bleeding from the developed kid-