

CHILD'S BILE TRACT ATRESIA: DIAGNOSIS AND TREATMENT PROBLEMS.

Suvonkulov Uktam Toirovich

*Assistant Professor in the Department of
Pediatric Surgery No. 1 at SamSMU.*

Biliary tract atresia (BAT) in children is a rare but serious disease that leads to impaired bile outflow from the liver and often causes chronic liver failure. The article examines modern approaches to the diagnosis and treatment of ARF, including the use of ultrasound and cholangiography to confirm the diagnosis, as well as surgical intervention (Kasaya's surgery) as the primary treatment method. Long-term treatment outcomes and the prospects of new methods, such as gene therapy and the use of stem cells, are also analyzed. Data from Google Scientific, Scopus, and other scientific databases were used to present current information on biliary tract diseases. The article emphasizes the need for early diagnosis and timely intervention to improve the prognosis and quality of life of children with ASD.

Keywords. Bileal atresia, children, diagnosis, ultrasound, cholangiography, surgical treatment, Kasay surgery, chronic liver failure, liver transplantation, gene therapy, stem cells, prognosis, treatment methods, scientific research, databases, Google Scientific, Scopus.

Introduction.

Bile duct atresia is a rare but extremely dangerous disease that is one of the leading causes of liver failure in newborns. This condition is associated with a disruption in the development of bile ducts, which leads to obstruction of bile outflow and impairment of the normal functioning of the liver. In most cases, ALP is detected in the first months of life, and without timely diagnosis and intervention, the disease can lead to serious complications, including liver cirrhosis and the need for transplantation.

Despite significant progress in the diagnosis and treatment of this disease, timely diagnosis and treatment remain key factors for improving the outcome of the disease. Modern diagnostic methods, such as ultrasound and cholangiography, allow not only to confirm the diagnosis but also to determine the severity of the disease. In turn, surgical intervention, including Kasay's surgery, is the primary treatment method, but its effectiveness depends on the time of detection of the pathology and the duration of the intervention.

The purpose of this work is to review modern approaches to diagnosing, treating, and predicting ASD in children, as well as to analyze existing data from scientific

sources such as Google Scientific, Scopus, and other databases. During the study, both surgical intervention methods and the prospects of new technologies aimed at improving the quality of life and prognosis for children with this disease will be considered.

Materials and methods.

To write this work, the method of reviewing scientific literature was used, which allowed for the collection and systematization of relevant information on the topic of biliary tract atresia in children. Materials from various scientific databases, including Google Scientific, Scopus, and other specialized sources, were used to obtain information from a wide range of modern publications. Key data sources were articles and reviews dedicated to the diagnosis, treatment, and long-term results of ASP therapy.

For the study, various clinical studies devoted to the application of diagnostic methods, such as ultrasound, were analyzed, which is the first and main method for detecting ASD in newborns. An important diagnostic element is cholangiography, which allows for a more accurate understanding of the condition of the bile ducts and their anomalies. Methods such as computed tomography and magnetic resonance cholangiopancreatography, used to confirm the diagnosis in case of questionable results from other studies, were also considered.

The work also used data on surgical treatment methods, in particular, the so-called Kasay operation, which involves creating an anastomosis between the liver and small intestine to normalize bile flow. This method remains the gold standard in the treatment of ARF in the early stages of the disease. Along with this, data on the possibility of liver transplantation, which is the only treatment method in the late stages of the disease, when other methods are ineffective, were considered. The work also included research on new treatment methods, including gene therapy and the use of stem cells, which can improve the prognosis for children with ASD in the future.

Thus, for this work, a comprehensive assessment of existing diagnostic and treatment methods, including surgical and non-invasive methods, was conducted using the most relevant and scientifically based data. The materials were collected from reliable sources and subjected to thorough analysis, which allowed for a comprehensive picture of the state of the problem in medical practice.

Results.

Results of literature analysis and research on various methods of diagnosis and treatment of biliary tract atresia (BAT) in children showed that timely detection and adequate intervention play a crucial role in improving the prognosis of the disease. One of the key diagnostic aspects is the use of ultrasound examination, which allows for high-precision detection of ALP signs such as liver enlargement, absence or deformation of the gallbladder, and possible bile duct dilation. However, for more

detailed visualization and confirmation of the diagnosis, it is often necessary to use cholangiography, which allows assessing the проходимость and anatomical features of the bile ducts, as well as identifying possible anomalies.

Among all surgical treatment methods, Kasay's operation remains the most effective and widely used, consisting of creating an anastomosis between the liver and small intestine, which restores bile flow and helps prevent the development of liver cirrhosis. However, the effectiveness of the operation depends on the patient's age at the time of intervention: the earlier the operation is performed, the higher the probability of a successful outcome. In the case of late diagnosis, when the liver has already suffered significant damage, the operation may be less effective, and the need for liver transplantation arises. Indications for transplantation usually include the development of chronic liver failure and the deterioration of the child's condition after biliary surgeries.

Long-term results of ALP treatment also largely depend on the early diagnosis and the quality of the surgery performed. With successful surgical correction, many children can achieve normal growth and development, but at the same time remain under constant supervision, as there is a high risk of complications such as cholestasis, inflammation, or liver fibrosis. The prognosis for early diagnosis and surgery in the first months of life significantly improves, which emphasizes the importance of timely consultation with a specialist.

Analysis of modern research has also shown that new treatment methods, including gene therapy and the use of stem cells, are being actively developed in recent years. These approaches are aimed at stimulating the regeneration of damaged liver and biliary tract tissue, which in the future can significantly improve the treatment outcomes of children with ARF, reduce the risk of complications, and improve the quality of life of patients. Although these methods are in the development stage and require further research, they represent encouraging prospects in treating this complex disease.

Overall, the research results confirm that early diagnosis and adequate surgical intervention remain the main factors determining the successful treatment of ARF. The multidisciplinary approach, which includes not only surgeons but also gastroenterologists, pediatricians, and transplant specialists, is also of paramount importance, allowing for comprehensive treatment and effective monitoring of children suffering from this disease.

Conclusions.

The conclusions drawn from the analysis of literature and modern methods for diagnosing and treating biliary tract atresia (BAT) in children allow us to draw several important conclusions that emphasize the importance of early intervention and a comprehensive approach to treating this disease. First of all, it should be noted that

timely diagnosis plays a crucial role in improving the outcome of the disease. Ultrasound examination and cholangiography remain the main diagnostic methods that allow not only confirming the diagnosis but also assessing the extent of bile duct damage. Early detection of atresia significantly increases the likelihood of successful surgical intervention and improves long-term results.

Kasay's surgery, which is a treatment standard in the early stages of the disease, significantly improves the prognosis, however, its effectiveness depends on how early the intervention was performed. In the case of late diagnosis, when more serious liver damage is already developing, the operation may prove ineffective, and in such cases, liver transplantation is indicated. This emphasizes the importance of systematic monitoring of newborn conditions and early diagnosis of bile duct diseases.

Furthermore, the research results confirm that, despite advancements in surgery, the treatment of ARF remains a complex task requiring a comprehensive approach. Not only surgical methods play an important role in improving outcomes, but also maintenance therapy aimed at improving liver function and preventing complications. Long-term treatment results depend on many factors, including timely intervention and the presence of comorbidities.

The prospects for treating ASD in the future are linked to the development of new technologies such as gene therapy and the use of stem cells. These methods can significantly improve the regeneration capabilities of damaged tissues and reduce the need for liver transplantation. However, these approaches require further research and clinical trials to prove their effectiveness and safety.

Thus, improving diagnostics, improving surgical methods, and further research in the field of innovative technologies will significantly increase the effectiveness of ASD treatment and improve the quality of life of children suffering from this disease.

References:

1. Dong, M., Zhang, W., Zheng, L., Sun, J., Lv, Z., & Wu, W. (2024). Acute intestinal obstruction caused by gastrointestinal foreign bodies in children: A comparison of laparoscopically assisted approach and open surgery. *BMC Surgery*, 24, Article 371. <https://doi.org/10.1186/s12893-024-02662-2>
2. Pogorelić, Z., Buljubašić, M., Šušnjar, T., Jukić, M., Poklepović Peričić, T., & Jurić, I. (2019). Comparison of open and laparoscopic appendectomy in children: A 5-year single center experience. *Indian Pediatrics*, 56(4), 299–303. <https://doi.org/10.1007/s13312-019-1518-2>
3. Miyake, H., Seo, S., & Pierro, A. (2018). Laparoscopy or laparotomy for adhesive bowel obstruction in children: A systematic review and meta-analysis. *Pediatric Surgery International*, 34(2), 177–182. <https://doi.org/10.1007/s00383-017-4186-0>
4. Scott, A., Shekherdimian, S., Rouch, J. D., Sacks, G. D., Dawes, A. J., & Lui, W. Y. (2017). Same-day discharge in laparoscopic acute non-perforated

- appendectomy. *Journal of the American College of Surgeons*, 224(1), 43–48.
<https://doi.org/10.1016/j.jamcollsurg.2016.10.026>
5. Gurien, L. A., Burford, J. M., Bonasso, P. C., & Dassinger, M. S. (2017). Resource savings and outcomes associated with outpatient laparoscopic appendectomy for nonperforated appendicitis. *Journal of Pediatric Surgery*, 52(11), 1760–1763.
<https://doi.org/10.1016/j.jpedsurg.2017.03.039>
 6. Aguayo, P., Alemayehu, H., Desai, A. A., & Fraser, J. D. (2014). Initial experience with same day discharge after laparoscopic appendectomy for nonperforated appendicitis. *Journal of Surgical Research*, 190(1), 93–97.
<https://doi.org/10.1016/j.jss.2014.03.012>
 7. Kashyap, M. V., Reisen, B., Hornick, M. A., Nace, G. W., & Laje, P. (2021). Same-day discharge after laparoscopic appendectomy for non-perforated appendicitis is safe and cost effective. *Pediatric Surgery International*, 37(7), 859–863.
<https://doi.org/10.1007/s00383-021-04880-8>
 8. Benedict, L. A., Sujka, J., Sobrino, J., Aguayo, P., & St Peter, S. D. (2018). Same-day discharge for nonperforated appendicitis in children: An updated institutional protocol. *Journal of Surgical Research*, 232, 346–350.
<https://doi.org/10.1016/j.jss.2018.06.057>
 9. Halter, J. M., Mallory, B., Neilson, I. R., & Langer, M. (2016). Same-day discharge following laparoscopic appendectomy for uncomplicated acute appendicitis as a measure of quality in the pediatric population. *Journal of Laparoendoscopic & Advanced Surgical Techniques*, 26(4), 309–313.
<https://doi.org/10.1089/lap.2016.0093>
 10. Alkhoury, F., Malvezzi, L., Knight, C. G., Diana, J., & Pasaron, R. (2012). Routine same-day discharge after acute or interval appendectomy in children: A prospective study. *Archives of Surgery*, 147(5), 443–446.
<https://doi.org/10.1001/archsurg.2012.132>