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Case Report

Functional Status of the Palate of Fater During VEGDS in Bile Duct Reconstructive Operations (Literature Review)

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Summary

Reconstructive surgeries on the biliary tract, especially with choledochoduodenostomy and other anastomoses, can cause changes in the functional state of the papilla of Vater. These changes can affect the regulation of bile flow, intestinal motility, as well as infectious and stenotic complications of the biliary tract. The aim of this study is to evaluate the functional state of the papilla of Vater using video esophagogastroduodenoscopy (VEGDS) after reconstructive surgeries on the biliary tract. During the study, pathological changes such as papilla patency, spasm, reflux and stenosis were analyzed in patients. The results showed that after reconstructive surgeries, some patients have hypofunction or hypertonicity of the papilla of Vater, which increases the risk of biliary stasis and chronic cholangitis. VEGDS plays an important role in the early diagnosis of these complications in the postoperative period and the choice of treatment.

Keywords: Bile ducts; Papilla of vater; Postoperative complications; Reconstructive surgery; VEGDS

Introduction

Surgical treatment of patients with biliary tract pathology remains a pressing and unresolved problem. The creation of biliodigestive anastomoses is important to prevent disruption of bile flow through the terminal part of the common bile duct, ensure adequate bile flow and eliminate mechanical jaundice [1]. Radical surgical interventions on the pancreas, duodenum and bile ducts are complex, traumatic, associated with various postoperative complications and a high risk of mortality [1,2]. Reconstructive surgery of the biliary tract is one of the complex surgical interventions performed to restore normal function of the gastrointestinal tract. According to a number of scientists, the most optimal option for eliminating these problems in 55% of cases is choledochojejunostomy, and in 93% of cases - hepaticojejunostomy [3]. In these operations, the assessment of the patency of the bile ducts and the functional state of the sphincter apparatus is of great importance. The Vater's papilla is the main anatomical and functional structure through which the bile and pancreatic ducts open into the duodenum, and is regulated by the sphincter of Oddi [4]. The study of the functional state of the biliary tree papilla after reconstructive operations plays an important role in the prevention of postoperative complications [3]. **The Role of VEGDS in Assessing the Vater's papilla.** VEGDS is one of the effective methods for visualizing and assessing the functional state of the Vater's papilla. This method allows assessing the following parameters.

Anatomical Changes: The Vater's papilla is the main structure regulating the flow of bile and pancreatic juice into the duodenum. After reconstructive surgeries or against the background of chronic pathologies, certain morphological changes (edema, strictures, deformations) may occur in the papilla (Table 1).

ANATOMICAL CHANGES		
Edema	**Strictures**	**Deformities**
Edema of the Vater's papilla usually develops after inflammatory processes (cholangitis, pancreatitis) or surgical interventions. Edema can cause narrowing of the sphincter apparatus, which complicates the normal outflow of bile and pancreatic juice. This condition can be accompanied by bile stasis and intestinal dysfunction in the early postoperative period.	Papillary strictures are cicatricial formations that develop as a result of long-term inflammatory processes or traumatic injuries. These contractions can disrupt the motor function of the sphincter of Oddi, which will lead to difficulty in the outflow of bile. Clinically, strictures can manifest as chronic pain, dyspeptic disorders, and obstructive jaundice.	Changes in the anatomical structure may adversely affect the functional state of the gingival papilla. After reconstructive surgery or in case of long-term biliary disease, papilla hypertrophy, diverticular changes or dislocation may be observed. Such deformations may disrupt the normal drainage function of the bile ducts and lead to postoperative complications.
MOTOR FUNCTIONS		
The Contraction and Uncontraction Mechanism of the Sphincter of Oddi		
NEUROGENİC REGULATİON	**HORMONAL REGULATION:**	**Mechanical factors:**
Vagus nerve: provides relaxation of the sphincter and increases the outflow of bile.		
Sympathetic nervous system: increases the tone of the sphincter, causing it to contract.	**Cholecystokinin:** secreted when food enters the duodenum and causes the sphincter of Oddi to open.	
Sphincter dysfunction: Functional disorders of the sphincter of Oddi can be observed after reconstructive surgeries or with long-term diseases of the biliary tract.	**Somatostatin and secretin:** inhibit sphincter function, increasing its tone.	When the gallbladder contracts, the sphincter opens and bile flows out. Peristaltic movements of the intestines can affect the function of the sphincter.
NATURE OF BILE FLOW		
Excessive Bile Flow	**Insufficient Bile Flow**	
(Hypersecretion, Uncontrolled Discharge)	(Hyposecretion, Obstructive Flow Disorder**)**	
In some cases, hypotonic dysfunction of the gallbladder papilla can cause uncontrolled reflux of bile into the intestine. This can lead to the release of bile independently of the digestive process and cause an imbalance in the digestive tract.	Insufficient bile flow may be due to narrowing of the bile ducts, hypertonicity of the sphincter of Oddi, or the presence of strictures. This condition can lead to serious digestive disorders.	
• Hypotonic sphincter of Oddi	• Hypertonicity (excessive contraction) of the sphincter of Oddi	
• Weakening of the sphincter after sphincterotomy or reconstructive surgery	• Strictures or swelling of the bile ducts	
• Chronic biliary tract disease or neurological disorders	• Anatomical changes after reconstructive surgeries	
	• Postoperative scar tissue	

Table 1: Assessment of the functional status of the Vater's papilla.

Motor Function: (The mechanism of contraction and opening of the biliary sphincter) The Vater's papilla provides a regulated flow of bile and pancreatic juice into the duodenum through the sphincter of Oddi. Correct functioning of the sphincter ensures coordination of the bile flow, the efficiency of the digestion process and protection of the bile ducts from infections [5,6].

The Nature of Bile Secretion: Normal physiological regulation of bile secretion is necessary for the effective functioning of the digestive system. The functional state of the Vater's papilla directly affects the nature of bile flow [7]. Bile outflow may be insufficient or excessive after reconstructive surgery or in cases of sphincter of Oddi dysfunction (Table 1). Studies have shown that after reconstructive operations on the bile ducts, hypotonic (a) or hypertonic (b) dysfunctions can be observed in the Vater's papilla [7,8] (Figure 1).

a **b**

Figure 1: Dysfunctions developing in the papilla of Vater after reconstructive surgery of the biliary tract.

In particular, hypertonicity of the sphincter of Oddi can lead to a disruption of the outflow of bile into the intestine, stagnation of bile and the development of chronic pain syndrome. On the contrary, hypotonic dysfunction can lead to infectious complications associated with bile reflux and the entry of intestinal microflora into the bile ducts.

Functional Changes in the Postoperative Period and Their Clinical Significance: Functional disorders of the gallbladder papilla after reconstructive surgery can cause problems with the regulation of bile flow. These disorders can be a consequence of a hypertonic or hypotonic state of the sphincter of Oddi, anatomical changes, or the formation of postoperative scar tissue. Functional disorders of the phalangeal joint after reconstructive surgery can be accompanied by various clinical symptoms (Figure 2).

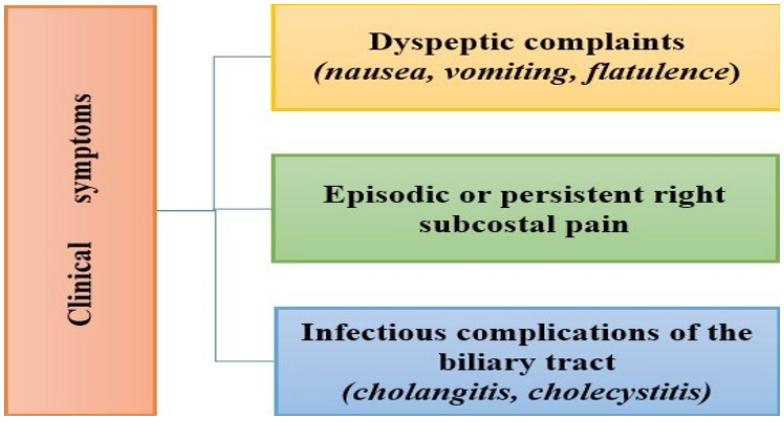

Figure 2: Clinical symptoms of functional disorders of the papilla of Vater after reconstructive surgery.

One of the main clinical symptoms is dyspeptic disorders (nausea and vomiting, flatulence and indigestion; difficulty digesting fatty foods), which can disrupt the balance of intestinal microflora and complicate digestion due to insufficient or excessive bile flow. Other symptoms include pain in the right hypochondrium (dull or cramping pain; pain that intensifies after eating fatty foods; sometimes a feeling of discomfort spreading to the back and shoulder). Hypertonicity of the sphincter of Oddi can obstruct the flow of bile, causing increased pressure in the bile ducts. One of the most noticeable symptoms is obstructive jaundice (yellowing of the skin and eyes; dark urine, light-colored stool; chronic fatigue and weakness), which can occur due to obstruction of the bile ducts due to stricture or edema of the papilla of Vater. Sometimes bile reflux and gastrointestinal complaints (constant bitterness and dry mouth; reflux symptoms; constant diarrhea and intestinal dysbacteriosis) can lead to uncontrolled bile reflux into the duodenum and reflux against the background of hypotension of the sphincter of Oddi. One of the frequent symptoms that complicate the work of surgeons are infectious complications (frequent cholangitis, periodic fever and chills, general malaise and weakness), which can lead to chronic infections due to bile stagnation and the entry of microorganisms into the bile ducts.

Principles of Treatment of Functional Disorders of the Vater's Ampulla After Reconstructive Surgeries: Treatment of functional disorders of the Vater's papilla after reconstructive surgeries is carried out individually depending on the patient's condition. In mild cases, drug therapy and diet may be sufficient (Figure 3).

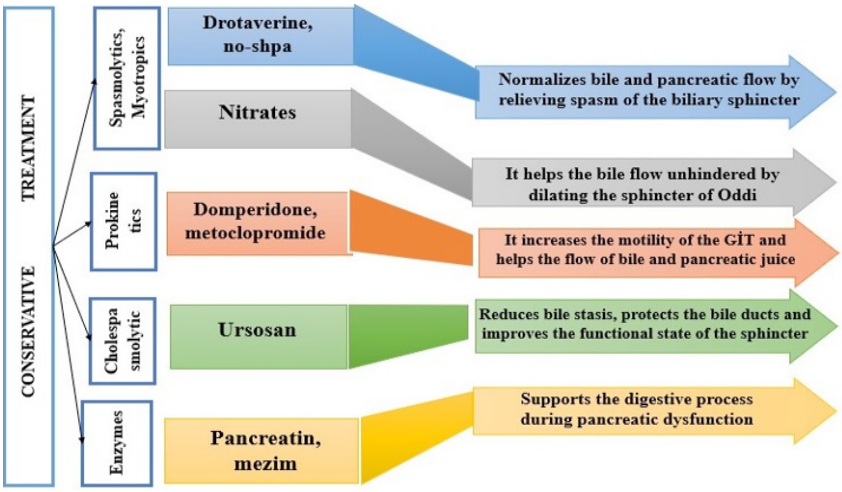

Figure 3: Conservative treatment regimen for functional disorders of the Vater's papilla after reconstructive surgery

while in severe cases, endoscopic or surgical interventions may be required. Changes in diet and lifestyle: avoid fatty and fried foods; eat small meals often; Factors such as stress reduction are part of the treatment regimen. Endoscopic sphincterotomy is performed in cases of sphincter of Oddi hypertension or strictures, with an incision made in the area of the papilla of Vater to ensure free flow of bile. Balloon dilation is performed in the presence of stricture or scar tissue in the area of the papilla of Vater using ERCP (endoscopic retrograde cholangiopancreatography). Bile duct stenting is used to keep the bile ducts open in cases of chronic stricture or obstruction. In cases of severe bile duct stenosis and complications after reconstructive surgeries, hepaticojejunostomy or duodenostomy surgeries are performed to ensure the outflow of bile through an alternative route into the intestine.

Conclusion

It is important to diagnose and properly treat functional disorders of the Vater's ampulla after reconstructive surgeries. Diagnostic methods such as VEGDS, ERCP and manometry play an important role in identifying these problems. Treatment can be conservative and endoscopic/surgical. For this reason, monitoring the papilla with VEGDS in the postoperative period and early detection of dysfunction are very important. Current approaches suggest solving these problems with endoscopic sphincterotomy or pharmacological interventions.

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