American Journal of Interdisciplinary Research and Development
ISSN Online: 2771-8948
Website: www.ajird.journalspark.org
Volume 15, April, 2023

THE USE OF A DIODE LASER IN THE COMPLEX TREATMENT OF VARIOUS PATHOLOGICAL CHANGES IN THE MUCOUS MEMBRANE OF THE ESOPHAGUS

Makhsudov Maksud Tuymuradovich2,
Akhmedov Gayrat Keldibaevich2,
Gulamov Olimjon Mirzakhitovich1,
Khudaynazarov Utkir Rabbimovich2,
Dusiyarov Mukhammad Mukumbaevich 2
1Republican Specialized Scientific and Practical
Medical Center of Surgery named after Academician V. Vakhidov, Tashkent, Uzbekistan
2Samarkand State Medical University, Samarkand, Uzbekistan

Annotation

This article is devoted to the diagnosis and treatment of one of the problems of modern medicine – the treatment of erosive and dysplastic changes of the mucous membrane in the esophagus. The data of the study and treatment of patients in the endoscopic department of the State Institution " RSSPMCS named after Academician V. Vakhidov" and in the diagnostic department of the Samarkand State Medical University. To improve the treatment parameters, laser radiation was used, which is part of modern complex treatment methods.

Keywords: erosion, dysplasia, complications, laser irradiation.

INTRODUCTION

Surgery of the esophagus began in the XIX century, because the complex anatomical location and access to the organ did not allow surgeons to expand their skills [1, 4, 15, 18].
Gastroesophageal reflux disease (GERD) develops with reflux of gastric contents into the esophagus, which leads to patient anxiety and various complications may develop [5, 7, 11, 19]. According to the authors, scientific studies conducted in Europe and North America have shown that GERD symptoms have been detected in 40% of the population, of which 25% receive drug therapy, and about 15% need surgical treatment [6, 9, 17, 21].
Rapidly developing laser medicine nowadays is used not only in the therapeutic, but also in the surgical direction, which is a direct reason for the correction of various pathologies of the digestive tract [2, 3, 10, 14, 20].
Therefore, today the problem of early diagnosis and the use of specific treatment tactics remains one of the big problems not only in gastroenterology, but also in other branches of medicine [8, 12, 13, 16].

The purpose of the study: To optimize diagnostic and complex tactics of treatment of erosive and dysplastic changes of the esophageal mucosa using endoscopic methods.

Materials and methods of morphological research: The results of a study of 32 patients with complicated forms of GERD were analyzed. The study was carried out by patients who applied to the State Institution "RSSPMCS named after Academician V.

Vakhidov" and to the diagnostic department of the Samarkand State Medical University. The age of patients ranged from 25 to 68 g. Female patients prevailed: women – 21 (65.6%), men – 11 (34.4%). In 8 patients (25.0%), the studies were conducted initially.

All patients with suspected changes in the esophageal mucosa underwent standard laboratory and instrumental methods of examination, including endoscopic methods. All patients underwent endoscopic examination in normal mode with a FUJINON FUJIFILM System 2500 Processor endoscope (Japan) and in narrow-spectrum mode (NBI mode) on an Olympus CV-170 endoscope (Japan). With conventional endoscopes, in 15 cases, 1% acetic acid was used for chromoscopy, which, when applied to the surface of the mucous membrane through a spray catheter, contrasts the surface of the mucous membrane due to denaturation of surface epithelial proteins and at the same time clearly visible areas of inflammation, dysplasia and neoplasia do not contrast with this solution and remain bright red. And in the narrow-spectral mode (NBI mode), different dyes are not used, which is a more convenient, safe and more effective method.
During the examination, erosive changes of the esophageal mucosa were diagnosed in most patients. 10 (31.3%) patients had a suspicion of Barrett's esophagus (Fig. 1). The International Prague Endoscopic Classification (2004) was used to determine the disease. Which determined the maximum length of the "flame tongue" (M) and the length of the circular changes (C) of the esophageal mucosa proximally from the gastro-esophageal junction.

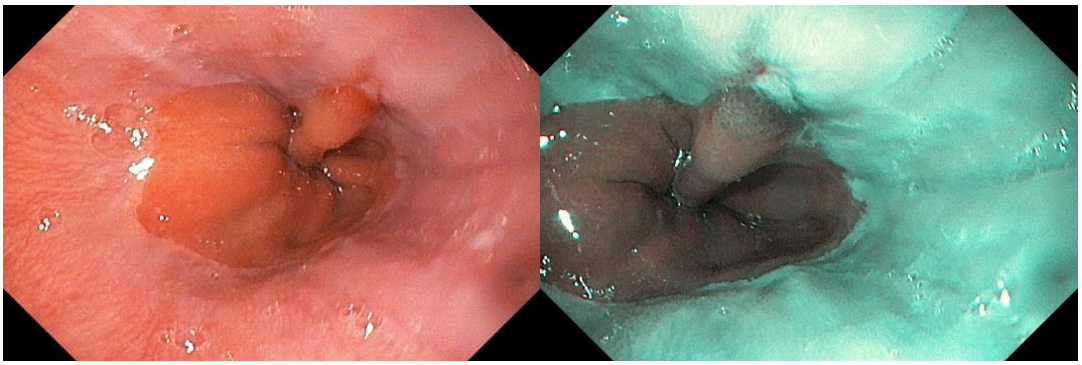

Fig. 1. Barrett's esophagus in normal and NBI mode.

A biopsy of a pathological site is one of the important criteria of the study. According to the Seattle Protocol, a biopsy is taken in 4 sites, starting from the Z-line and passing proximally along 2 cm of the length of the site. In this case, it is especially taken from the distal and proximal part of the metaplasia site.

Research Results

Barrett's esophagus without dysplasia was found in 3 cases out of 28 studied sites. In the NBI mode, 21 observations (65.6%) revealed a villous/sinuous structure of the esophageal mucosa and 11 (35.4%) revealed a flat type of mucosa without a certain structure of pits or folds. Morphological studies have established that, although dysplasia occurs more often against the background of intestinal metaplasia (14.2%), however, it can also form against the background of gastric metaplasia (10%). The occurrence of dysplasia increases, as is known, the risk of esophageal adenocarcinoma, which allows us to recommend the elimination of metaplastic areas not only in intestinal, but also in gastric metaplasia.

Against the background of metaplasia, ulcerative changes occur in the esophagus, which dictates the need to eliminate these areas. The high frequency of ulcerative changes in the esophagus against the background of gastric metaplasia also testifies in favor of carrying out measures aimed at removing the metallized lesion, regardless of the type of metaplasia.
All patients with Barrett's esophagus (n=10) with suspected esophageal neoplasms are referred for additional research and treatment. In this group of patients, endoscopic treatment was carried out in several courses.
Surgical treatment aimed at eliminating reflux of gastric contents into the esophagus, as well as reducing inflammatory changes, was the first stage. After the elimination of the underlying cause, then in a more favorable period, interventions were performed that directly removed metaplastically altered areas of the esophagus (in our study, mucosal resection according to the method we developed, followed by IR-diode coagulation).
Axial hernia of the esophageal orifice of the diaphragm was the cause of reflux in all patients. Adenocarcinoma was detected in 2 (6.2%) patients. Preoperative preparation was carried out according to the standard. The patients underwent the following operations: in 2 patients with adenocarcinoma with transition to the cardiac part of the stomach – proximal gastric resection with resection of the abdominal esophagus and the formation of esophagogastroanastomosis end to side. There were no general complications in the postoperative period. Patients are sent for dispensary observation at the place of residence.

Clinical case №1. Patient Zh., 57 years old, on 09/26/2022, applied to the polyclinic of the State Institution "RSSPMCS named after Academician V. Vakhidov" with complaints of pain in the epigastric region, constant heartburn, nausea, vomiting, weight loss. Considers herself ill for 10 years. She was treated conservatively several times, but each time after 2-3 months the above complaints developed again.

The patient performed EGDFS. Conclusion: "Hernia of the esophageal orifice of the diaphragm, 4 cm in size, with a length of the esophagus of 20-21 cm, Complication: Reflux esophagitis, IV art. Barrett's esophagus. Dystopia of the gastric mucosa on the esophagus for up to 6 cm. Diffuse catarrhal gastritis." Biopsy materials were taken from the zone of dystopia and hyperplasia. The patient was recommended surgical treatment, but she refused. The patient underwent a 1-course of diode laser radiation (Fig. 2). Conclusion of histological examination No. 7019-7020. Gastric mucosa with pronounced centralization. The patient is recommended standard conservative treatment and repeated examination in a month.

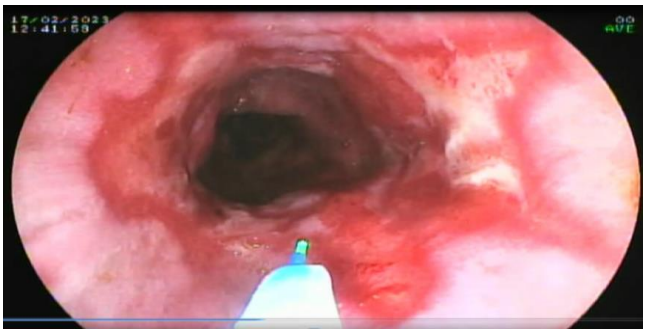

Fig. 2. Laser irradiation of esophageal dysplasia.

After 1.5 months (48 days) at 11/14/2022, the patient Zh., 57 years old, re-applied to the polyclinic of the State Institution "RSSPMCS named after Academician V. Vakhidov". In dynamics, her complaints have significantly decreased. The general condition has improved. The patient underwent a control EGDFS. Conclusion: "Hernia of the esophageal orifice of the diaphragm, 4 cm in size, with a length of the esophagus of 20-21 cm, Complication: Reflux esophagitis, II-III art. Superficial gastritis." The patient underwent a 2-course of diode laser radiation. It is recommended to continue conservative treatment and re-examination after 2 months.

Clinical case №2. Patient N., 80 years old, on 01.11.2022, turned to the polyclinic of the State Institution "RSSPMCS named after Academician V. Vakhidov" with complaints of pain in the chest area, constant heartburn, nausea, vomiting, hiccups, general weakness. Considers himself ill for 10-15 years. He was treated conservatively several times, but the effect after conservative therapy lasted about 5-6 months.

The patient underwent EGDFS. Conclusion: "Hernia of the esophageal orifice of the diaphragm, measuring 9-10 cm, with a length of the esophagus of 20-21 cm, Complication: Reflux esophagitis, IV art. Barrett's esophagus. Dystopia of the gastric mucosa on the esophagus for 10 cm. The Quincke ulcer of the middle third of the esophagus is 10 cm from the mouth with a size of 1.0x0.8 cm." Biopsy materials were taken from the zone of dystopia and hyperplasia. Due to his great age and concomitant pathologies, complex (laser + conservative) treatment is recommended for the patient. The patient underwent a 1-course of diode laser radiation (Fig. 3). Conclusion of histological examination No. 7934-7935. "Apaptosis of the esophageal epithelium". The patient is recommended standard conservative treatment and repeated examination for 15 days.

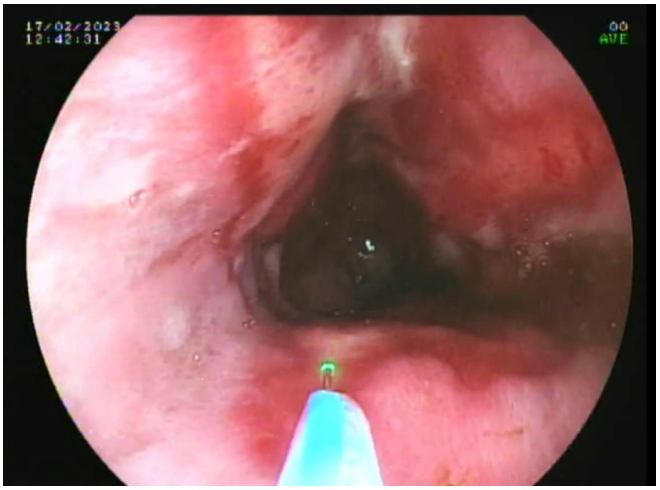

Fig. 3. Endoscopic picture of laser irradiation.

15 days later, on 11/16/2022, Patient N., 80 years old, re-applied to the polyclinic of the State Institution "RSSPMCS named after Academician V. Vakhidov". A significant decrease in complaints was observed in the dynamics. The general condition has improved. The patient underwent a control EGDFS. Conclusion: "Hernia of the esophageal orifice of the diaphragm, measuring 9-10 cm, with a length of the esophagus of 20-21 cm, Improvement of reflux esophagitis on the III art. The Quincke ulcer of the middle third of the esophagus is 10 cm from the mouth with a size of 0.8 x 0.5 cm. "The patient underwent a 2-course of

diode laser radiation. It is recommended to continue conservative treatment and re-examination in a month.

Conclusions:

1. GERD is one of the more common diseases that leads to erosive and dysplastic changes in the mucous membrane of the esophagus, which can lead to various complications (esophagitis, ulcer, stricture, Barrett's esophagus and adenocarcinoma), which are important to diagnose in time and determine treatment tactics.

2. The results of endoscopic and morphological studies have proved that the endoscopic method of treating erosive changes of the esophageal mucosa using IR-diode laser irradiation in the above doses has a good effect on regeneration and accelerates the healing of the esophageal mucosa.

3. The use of an IR-diode laser for complex treatment before and after the surgical period gives a good effect for healing erosive changes in the mucous membrane of the esophagus.

References:

1. Анохина Г. Болезни пищевода, желудка и кишечника. – Litres, 2022.
2. Ахмедов Г. К., и соавт. Исследование особенностей воздействия ик-диодовых лазерных лучей на слизистую оболочку пищевода свиней в эксперименте // ISSN 2181-466X. Вестник врача. №4 (108). 2022. Стр. 25-29.
3. Ахмедов Г.К., Гуламов О.М., и др. Роль разных эндоскопических исследований при диагностике и лечении эрозивных и диспластических изменений слизистой оболочки пищевода. // ISSN 2181-466X. Вестник врача № 4(101). 2021. С.10-13.
4. Ахмедов Г.К., Гуламов О.М., и др. Морфологические изменения слизистой оболочки пищевода при воздействии ИК-диодным лазером в условиях эксперимента на животных. // ISSN 2181-466X. Вестник врача. №4 (108). 2022. Стр. 30-36.
5. Байбеков И. М., Бутаев А. Х., Мардонов Д. Н. Влияние лазерного излучения на взаимодействие капроновых нитей с тканями ран (экспериментальное исследование) //Лазерная медицина. – 2019. – Т. 23. – №. 2. – С. 37-43.;
6. Гафуров С. Д., Катахонов Ш. М., Холмонов М. М. Особенности применения лазеров в медицине //European science. – 2019. – №. 3 (45). – С. 92-95.;
7. Гуламов О.М., Ахмедов Ғ.К., Махмудов С.Б., Нарзуллаев Ш.Ш. Особенности диагностики и хирургической тактики при грыжах пищеводного отверстия диафрагмы.// Проблемы биологии и медицины, 2022, №3 (136). ISSN 2181-5674. Стр. 21-24.
8. Гуламов О.М., Ахмедов Ғ.К. Эндоскопический метод лечения осложнений гастроэзофагеальной рефлюксной болезни с применением лазера. // «Высокие технологии в хирургии» материалы международной-научно-практической конференции (г. Самарканд, 14.12.2022 г.) Проблемы биологии и медицины, 2022, № 6.1 (141). ISSN 2181-5674. стр. 106-109.
9. Емельянова Э. А., Асекритова А. С., Кылбанова Е. С. Болезни пищевода. – ООО ДиректМедиа, 2019

10. Касьянов Д. А. Лазерные технологии и их применение в медицине: предпосылки и влияния //StudNet. – 2022. – Т. 5. – №. 6. – С. 7155-7163.;
11. Пермякова Е. С., Карпеева Ю. С., Невская Е. А. Методы выявления заболеваний пищевода у пациентов в разном возрасте //Медицина: теория и практика. – 2020. – Т. 5. – №. 1. – С. 102-111.;
12. Тучин В. Лазеры и волоконная оптика в биомедицинских исследованиях. – Litres, 2022.
13. Хведелидзе Л. Л. Лазеры в медицине //Наука и инновации-современные концепции. – 2021. – С. 67-70.;
14. Шангина О. Р., Гайнутдинова Р. Д. Взаимодействие лазерного излучения с биологическими тканями //Практическая медицина. – 2019. – Т. 17. – №. 1. – С. 24-27.
15. Шуваева В. Н., Горшкова О. П. Влияние низкоинтенсивного лазерного излучения на спектр поглощения крови крыс //Фундаментальные науки–медицине. В 2 ч. Часть 2. – 2022. – С. 403.;
16. Эмбутниекс Ю. В., Валитова Э. Р., Бордин Д. С. Новый подход к лечению гастроэзофагеальной рефлюксной болезни: защита слизистой оболочки пищевода //Эффективная фармакотерапия. – 2019. – Т. 15. – №. 18. – С. 16-22.;
17. Baybekov I. M. et al. Influence of Light Emitting Diode on Bone MarroBт and Healing of Dermatome BTounds //J Bone MarroBт Res. – 2015. – Т. 3. – №. 156. – С. 2.;
18. Grintcov A.G., Ishchenko R.V., Sovpel I.V., Sovpel O.V., Balaban V.V. Causes of unsatisfactory results after laparoscopic hiatal hernia repair. Research and Practical Medicine Journal. 2021;8(1):40-52.
19. Gulamov O.M., Ahmedov G.K., Khudaynazarov U.R., Saydullayev Z.Ya. Diagnostic And Treatment Tactics in Gastroesophageal Reflux Disease. // Texas Journal of Medical Science ISSN NO: 2770-2936 Date of Publication:18-03-2022. A Bi-Monthly, Peer Reviewed International Journal. Volume 6. P. 47-50.
20. Gulamov O.M., Babajanov A.S., Ahmedov G.K., Achilov M.T., Saydullaev Z.Ya., Khudaynazarov U.R., Avazov A.A. Modern methods of diagnosis and treatment of barrett esophagus. // Doctor's herald №2(94)-2020. ISSN 2181-466X. 116-120. DOI: 10.38095/2181-466X-2020942-116-120.
21. Temirovich, A. M., Keldibaevich, A. G., Inoyatovich, N. S., Shonazarovich, S. I., &Ochilovich, M. F. (2022). Features of diagnostics and surgical tactics for Hiatal hernias. International Journal of Health Sciences, 6(S2), 6029–6034.