IJACT, Volume 4, Issue 02, 2026 ISSN: 2995-5378
http://medicaljournals.eu/index.php/IJACT

INTERNATIONAL JOURNAL OF ALTERNATIVE AND CONTEMPORARY THERAPY

Justification of Local Ozon Therapy in the Surgical Treatment of Anaerobic Paraproctitis

Ruzimuradov N.B.
Samarkand State Medical University

Dusiyarov M.M.
Samarkand State Medical University

Khuzhabayev S.T.
Samarkand State Medical University

Abstract: A study was conducted based on the analysis of the results of diagnosis and treatment of 124 patients with anaerobic paraproctitis. In 17.7%, involvement of the perineal muscle structures in the pathological process was noted. This category of patients was characterized by a particularly severe and aggressive course of the disease. The median area of the lesion was 160 cm2, which required extensive operations to remove necrotic tissues. The use of local hydropressive ozone therapy in the complex of therapeutic measures for anaerobic paraproctitis contributed to the early cleansing of wounds from purulent-necrotic tissues (from 7.2±0.15 to 5.6±0.15 days) and the beginning of epithelialization (from 9.9±0.38 to 7.3±0.27 days) and the duration of inpatient treatment (from 31.5±2.2 to 26.5±1.3 days).

Keywords: Anaerobic paraproctitis, surgical treatment, local ozone therapy

Introduction

The level of development of the problem of anaerobic paraproctitis in world literature is quite high, however, it remains heterogeneous and largely debatable. Itzhak Brook's works made significant contributions to the study of the pathogenesis, microbiological features, and clinical course of anaerobic infections of soft tissues, which detailed the role of obligate anaerobes, their associations with aerobic flora, and the importance of timely antianaerobic therapy. Research by Dennis L. Stevens emphasizes the rapid progression of necrotizing forms of infection, the need for early aggressive surgical tactics, and comprehensive intensive treatment, which has direct relevance to severe forms of anaerobic paraproctitis.

According to research by various authors, in recent years in the literature of the CIS and Central Asian countries, the problem of anaerobic paraproctitis has been covered in a smaller volume and mainly in the form of clinical observations and generalized reviews. The works of G. I. Vorobyev and his school are devoted to the issues of surgical treatment of paraproctitis, classification of disease forms, and postoperative management of patients, however, the modern aspects of targeted antianaerobic therapy, staged rehabilitation, and intensive care are presented in fragments. In Uzbekistan, there are only a few systematized studies devoted to anaerobic paraproctitis, taking into account local epidemiological,

clinical-organizational, and resource characteristics, which necessitates further in-depth study and development of adapted modern treatment approaches.

Purpose of the Study: to determine the effectiveness of local hydropressive therapy in the treatment of interosseous wounds after surgical treatment of anaerobic paraproctitis.

Research material: From 2011 to 2025, a study was conducted in the coloproctology department of the multidisciplinary clinic of the Samarkand State Medical University, based on the analysis of the results of diagnostics and treatment of 124 patients with anaerobic

Of the analyzed patients, 16 patients were admitted within 4 to 6 days of the onset of the clinical picture of AP, of whom more than half of the patients - 9 (56.2%) - had a severe or extremely severe condition. After 7 days and later from the onset of the disease, 8 patients were hospitalized, and in this group, the general condition was severe in 7 (78%) patients. In the structure of AP patients, men predominated - 88 (70.6%) versus 36 (29.1%) women. Due to clear gender differences, the gender factor was analyzed separately as a risk factor for mortality in this category of patients.

Out of 124 patients operated on in our department, 22 (17.7%) had perineal muscle structures involved in the pathological process. This category of patients was characterized by a particularly severe and aggressive course of the disease. The median area of the lesion was 160 cm2, which required extensive operations to remove necrotic tissues.

Most patients - 45 (36.3%) were hospitalized within 2-3 days of the onset of the disease. The longer the acute purulent process persists in the pararectal tissue, the wider it encompasses and destroys the surrounding tissues.

When analyzing the causes of late hospitalization, it was revealed that the vast majority of patients seek help only after independent attempts at conservative treatment - 118 (95.1%), less often - 6 (4.9%) - due to errors in the diagnosis of outpatient surgeons.

The connection of the abscess with the rectum was clearly established in 45 patients (36.2%). In 67 patients (54.1%), the wound or injuries communicated with the anal canal, more precisely, with its posterior wall. In 65 (52.4%) cases, this was a subcutaneous access - the probe was directed towards the anus and entered the intestinal lumen almost freely, under the skin, i.e., the fistula was intrasphincteric.

In 57 (45.9%) cases, the fistula course was directed almost parallel to the anus wall, and a thick layer of the sphincter tissue was found between it and the anus - a complex extravascular fistula was formed. Finger rectal examination was performed in all patients during the postoperative wound healing period. In 45 (36.2%) cases of wound contact with the anal canal, either an already formed internal opening of the purulent tract in the form of a slightly painful depression on the posterior wall of the anal canal was detected, or it was a painful, compacted area. The detection of an internal fistula opening or suspicion of it in most patients indicated that AP is a complicated form of conventional acute paraproctitis, not some separate specific nosology.

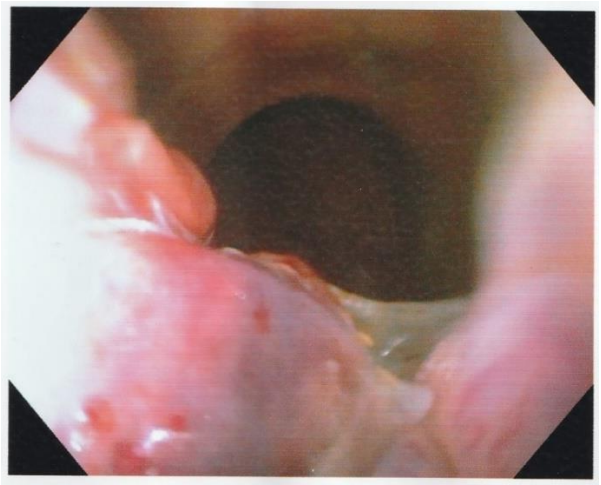
Nevertheless, in 38 (30.6%) cases, with the anterior localization of the abscess, it was impossible to immediately determine or subsequently suspect the connection of the wound to the rectum, and it is possible that in these cases, indeed, we are talking about Fourier's disease (gangrene).

Gram-negative flora was most frequently distinguished, among which E. coli predominated. Escherichia coli was detected in 46.8% of cases. The main anaerobic pathogen was clostridial infection (41.1%). At the same time, it is important to note that 28 (22.6%) patients had a polymicrobial etiology of the pathological process. (table. 3.

The formation of fistulas after surgery was observed between 6 and 12 months and was noted in 57 (45.9%) patients. Of these, 28 (49.1%) patients were successfully operated repeatedly at the clinic, and another 13 (22.8%) patients were operated on at their place of residence. Various degrees of anal sphincter insufficiency were observed in 19 (23.1%) patients in the long term after surgical treatment. They were prescribed conservative therapy (gymnastics of the anal sphincter and pelvic floor muscles), and in a number of cases, muscular electrostimulation was performed in parallel with therapeutic exercises in outpatient settings with a positive result.

The local signs of AP are quite similar to acute banal (vulgar) paraproctitis. A significant difference is the rate at which the disease spreads. In the area 2-4 cm from the anus, sometimes directly next to the transitional fold, a sharply painful inflammatory focus appears. Radial skin folds smooth out, the shape of the anus becomes asymmetrical. Later, skin hyperemia appears and fluctuation can be detected when pus spreads from the cellular spaces under the skin (Figure 1).

Figure 1. Local signs of anaerobic paraproctitis in patient P., 47 years old



Patient P. 47 years old. RRS revealed infiltrative edema on the rectal posterior wall in anaerobic paraproctitis

During rectomanoscopy, the mucous membrane in the area adjacent to the infiltrate was hyperemic, and the vascular pattern had a reticular structure. When the intestinal lumen was compressed by an infiltrate, the mucous membrane above it became smooth, the folds were absent, and the mucous membrane was pale. (Figure 2). Ultrasound examination reveals tissue thickening with hyperechogenic foci with reverberation artifacts, causing "dirty" darkening due to gas accumulations (Figure 3).

Figure 3. Ultrasonogram of patient S., 42 years old. Thickening of the tissue with hyperechogenic foci is visualized.

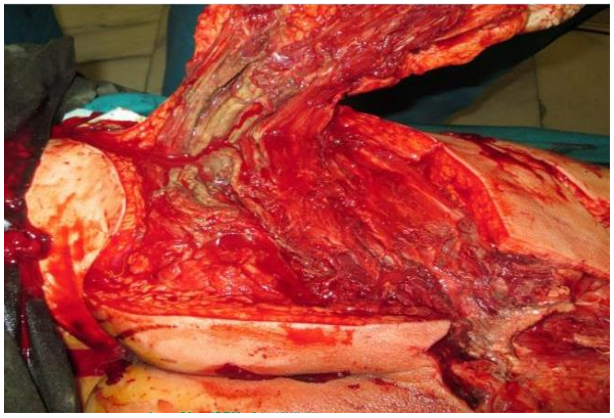
Figure 4. MR tomogram. Patient J., 63 years old. On the sagittal section, an asymmetrical thickening of the fascial sheath with fluid inclusions is visualized.

During computed tomography in patients with AP, pathognomonic signs of the anaerobic process can be visualized: asymmetrical thickening of the fascial sheath, fluid inclusions, thickening of adipose tissue, and subcutaneous emphysema (Fig. 4).

Results and their discussion. Surgical dissection of the anaerobic abscess of the perineum was performed only under intubation anesthesia or spinal anesthesia. This not only eliminated pain syndrome during traumatic intervention in severely ill patients, but also allowed for maintaining the ventilation regimen for the necessary postoperative period, which was necessary for the vast majority of patients. The duration of mechanical ventilation was determined not so much by the gas composition of the blood, but also by the restoration of water-electrolyte balance, normalization of metabolic indicators, and the clinical picture of decreased intoxication manifestations, which were necessarily controlled by the sum of points according to the SAPS system.

The intervention was carried out through a wide incision across the entire area of the identified inflammatory changes. This made it possible to conduct a thorough intraoperative revision with an assessment of the extent of soft tissue damage, assess the demarcation between visible damaged and healthy tissues, and identify possible pockets and drains that were drained at the end of the operation.

The essence of the operation itself consisted in the thorough total removal of all non-viable tissues, without limiting such actions, neither by the size nor the configuration of the resulting wound, since the main task at this moment was to save the patient's life. The criterion for the viability of the formed wound surface was the distinct capillary bleeding of tissues (Figure 5).



Patient D. 39 years old. Intraoperative photo of anaerobic paraproctitis involving necrectomy stage with right hip involvement.

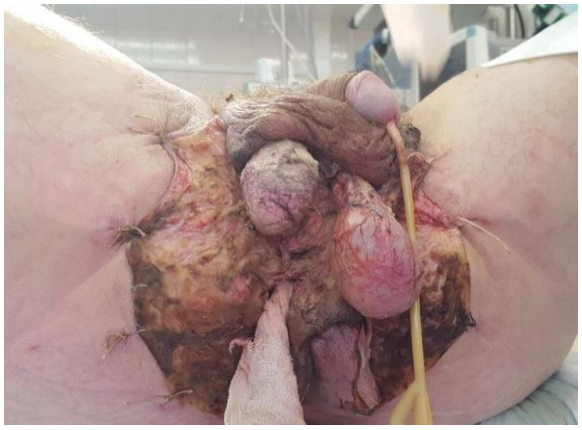


Figure 6. Patient M., 61 years old. Intraoperative photo of wound suturing stage with edge visualization.

As the final stage in questionable cases, the following technique was used in 22 (17.7%) patients: the edges of the wound were turned out, gauze balls were placed on them, and fixed to the intact skin, which allowed for good visual control (Figure 6).

Removal of small areas of lysed tissues during repeated bandaging occurred in 97 (78.2%) of 124 patients, and the elimination of newly formed purulent deposits of various localizations occurred in 48 (38.7%) patients. The main task of radical intervention for any form of AP appears to be the single one - opening the perineal phlegmon and total removal of all non-viable tissues. But with this, the surgical part of treatment did not end in most patients. In 98 (79.0%) patients, newly emerged necrotic foci were found during dressings in the first few days of the postoperative period, which were also removed by acute removal under general anesthesia and in "purulent" operating conditions. In 48 (38.7%) patients, additional purulent fistulas were opened. At the same time, it is important to note that 7 patients were exposed to fistulas of several locations.

Complications of Clavien-Dindo I-II degree developed in 44 patients. However, considering the severity of the primary disease, the need to prescribe antipyretics, analgesics, and antibacterial therapy in all patients, these patients were excluded from the analysis of postoperative complications. In the first days of the postoperative period, the need to re-remove the formed small areas of lysed tissues during repeated bandaging arose in 97 (78.2%) of 124 patients. However, considering the nature of the disease, this aspect was not considered a deviation from the "normal" course of the postoperative period. Nevertheless, 9 (7.2%) had to perform repeated necrectomy, open additional fistulas, and remove lysed tissues in the operating room under general anesthesia.

Thus, in the structure of postoperative complications, clinically significant (III - V degrees Clavien-Dindo) postoperative complications requiring repeated surgery or threatening the patient's life occurred within 30 days in 21 (16.9%) patients. In 4 (3.2%) patients, the postoperative period was complicated by bleeding from the necrectomy zone, in the listed cases, the bleeding was stopped by suturing in the operating room.

Liver failure syndrome was noted in 8 patients (6.4%) and manifested as hyperbilirubinemia exceeding 20 μm/l and the appearance of jaundice.

In 15 patients (12.1%), decompensation of the pulmonary system was noted, which, against the background of the ongoing therapy, manifested itself in the development of tachypnea with the

participation of accessory muscles. These patients required artificial lung ventilation in intensive care units.

Symptoms of renal failure in the postoperative period were noted in 6 (4.8%) patients with AP. We considered an increase in creatinine levels above 130 μmol/L as one of the first symptoms of renal dysfunction. In two cases, this category of patients required dialysis.

Of the 124 patients in the analyzed group, 11 (8.8%) patients died at the clinic. As mentioned above, these were extremely severe patients admitted with septic shock symptoms, and all measures taken in the intensive care unit proved ineffective. 8 patients in this group died from intoxication against the background of the progression of anaerobic paraproctitis with damage to the large cellular spaces of the pelvis, perineum, and scrotum.

In 1 case, a patient developed a myocardial infarction on the 6th day after surgery. In 2 patients, the lethal outcome occurred against the background of pulmonary artery thromboembolism.

The average duration of inpatient treatment of deceased patients was 33.8 days ± 24 days (1-42 days).

Out of 124 analyzed patients, 59 (47.6%) patients were treated with local ozone therapy.

The effectiveness of the local anti-inflammatory effect of ozone therapy in anaerobic forms of acute paraproctitis was assessed by the timing of the disappearance of perifocal inflammatory changes and endotoxemia phenomena.

To obtain the ozone-oxygen mixture, the OOT-N-01-Arz-01/1 "Medozon BM" ozone therapy unit, manufactured by Medozon LLC, was used.

After performing a radical surgical operation under general anesthesia, intraoperatively, the cavity of the purulent focus is flushed under pressure with 400-800 ml of ozonated isotonic sodium chloride solution with a bactericidal ozone concentration of 8-10 mg/l. Washing of the pararectal wound is carried out for 1-3 days 2-3 times a day in the same volume and concentration of ozone. After cleaning the wound and the appearance of granulation, the ozone concentration in the isotonic sodium chloride solution is reduced to 2 mg/l.

In patients, by the end of the first day of treatment, a decrease in skin hyperemia and perifocal edema was observed. On average, by 3.1±0.43 days after the opening of the abscess, the inflammatory changes decreased. Local manifestations of the inflammatory process were also characterized by the dynamics of changes in the acidity of the wound discharge. When using ozone therapy, a shift in pH to an alkaline state, indicating a smooth course of the wound process, was observed already on the 4th day. pH on the 1st day - 5.42±0.08; on the 3rd day - 6.8±0.35; on the 5th day - 7.21±0.24; on the 7th day - 7.62±0.18. In no case was a state of secondary acidosis observed.

The presence of a local purulent-necrotic focus in the pararectal tissue in the patient was accompanied by a number of changes of a general biological nature, indicating the development of purulent intoxication in them. This manifested as a rise in body temperature, characteristic changes in the number of leukocytes in the peripheral blood and the leukocyte intoxication index, an increase in the level of medium-mass molecules, and changes in the protein spectrum of the blood plasma.

When using ozone therapy in the treatment of acute anaerobic paraproctitis, it was possible to achieve normalization of body temperature in 9 patients already on the 1st day of treatment, in 20 patients on the 2nd day of treatment, and on average already by 2.84±0.15 days. Body temperature before surgery was 38.9±1.2°C; on day 1 38.6±0.96°C; on day 2 37.8±1.3°C; on day 3 36.5±1.4°C.

Manifestations of purulent intoxication were also reflected in changes in the blood picture: the level of leukocytes before surgery was 11.2±0.84 x 1 U/L; on the 2nd day after surgery - 8.2±0.9 x 109/L; on the

3rd day - 7.2±0.97 x 109/L; on the 5th day - 7.3±1.1 x 109/L. Normalization of the indicator by 2.25±0.35 days.

The most objective criteria for evaluating endotoxicosis were LII values and the level of medium-weight molecules in blood plasma. Dynamic observation of the peripheral blood picture in patients of the main group allowed for the normalization of the total number of leukocytes, the leukocyte formula, and LII by the 3rd-4th day after surgery. This confirms the presence of a pronounced detoxification effect when using ozone therapy in the treatment of acute paraproctitis. When studying the level of medium-mass molecules in blood plasma, it was noted that on the 1st day of observation, it increased by almost two times compared to normal figures.

Thus, the presented data indicate that the presence of anaerobic processes in the pararectal tissue in the patient is accompanied by a manifestation of general intoxication, which cannot but affect the course of the wound process. This involves the use of anti-inflammatory therapy, as well as the optimal selection of a drug for local treatment, which has not only local but also general effects on the body. The use of ozone therapy allows, at the earliest possible time, to suppress the manifestations of general intoxication, which contributes to a smooth course of the wound process. The use of ozone therapy has reduced the likelihood of secondary infection attachment by 4 times compared to traditional therapy. The high antimicrobial effect of ozone therapy was also confirmed when analyzing the timing of reduction of bacterial contamination below the critical level, accelerating the cleansing of the purulent wound from the presence of microflora by 2.4 times compared to the traditional method. By duration, this coincided with the completion of the wound cleansing process from purulent-necrotic masses.

The use of ozone therapy in the treatment of acute anaerobic paraproctitis allows not only to combat wound infection but also to prevent secondary infection of the pararectal wound during treatment. The advantage of the proposed method is explained by the effective wound healing and the effect of ozone therapy on both gram-positive and gram-negative microorganisms and anaerobes.

The described positive aspects of using ozone therapy in the treatment of acute paraproctitis contribute to a smoother course of the wound process.

When using water-soluble ointment-based wipes for local treatment of pararectal wounds, wound cleansing occurred only on average at 6.2±0.15 days.

When using ozone therapy, the most pronounced necrolitic effect was noted. A day after the start of treatment, the number of purulent-necrotic masses sharply decreased. Rapid and complete demarcation of the necrotic areas occurred. Complete cleansing of the wound from purulent-necrotic masses occurred on the 4.61±0.15th day.

The slow cleansing of wounds from purulent-necrotic discharge, the sluggish course of the wound process in patients of the comparison group, led to the fact that granulation tissue in the form of individual islands on the walls and bottom of the wound appeared only on the 7.9±0.42nd day (Table 3.3.2). It should be noted that they developed unevenly, appearing as islands among areas of necrosis covered with a fibrin coating.

The use of ozone therapy in treatment ensured complete necrosis in the wound and led to the earlier appearance of granulation tissue that evenly filled the wound defect, averaging 5.92 ±0.18 days. The granulations were fine-grained, pink or intensely crimson in color.

To determine the rate at which the wound volume decreases per unit time, with different treatment methods, a dynamic examination of the wound volume was performed. The volumetric regeneration index (in % per day) was determined using the proposed formula.

Positive tendencies of the wound process associated with the transition to the regeneration phase were subsequently reflected in the timing of the appearance of marginal epithelialization. In patients of the comparison group, they averaged 9.9±0.38 days. In patients of the main group, marginal epithelialization appeared on average 2 days earlier - already on the 7.3±0.27th day (Table 3.3.3).

The duration of complete healing of the pararectal wound in the main group was 19.23±1.3 days (in the comparison group 25.97±2.2). The duration of treatment in the hospital was reduced to 6.74±0.24 bed-days.

When using water-soluble ointment-based wipes for local treatment of pararectal wounds, wound cleansing occurred only on average at 6.2±0.15 days.

When using ozone therapy, the most pronounced necrolitic effect was noted. A day after the start of treatment, the number of purulent-necrotic masses sharply decreased. Rapid and complete demarcation of the necrotic areas occurred. Complete cleansing of the wound from purulent-necrotic masses occurred on the 4.61±0.15th day.

The slow cleansing of wounds from purulent-necrotic discharge, the sluggish course of the wound process in patients of the comparison group, led to the fact that granulation tissue in the form of individual islands on the walls and bottom of the wound appeared only on the 7.9±0.42nd day (Table 3.3.2). It should be noted that they developed unevenly, appearing as islands among areas of necrosis covered with a fibrin coating.

The use of ozone therapy in treatment ensured complete necrosis in the wound and led to the earlier appearance of granulation tissue that evenly filled the wound defect, averaging 5.92 ±0.18 days. The granulations were fine-grained, pink or intensely crimson in color.

To determine the rate at which the wound volume decreases per unit time, with different treatment methods, a dynamic examination of the wound volume was performed. The volumetric regeneration index (in % per day) was determined using the proposed formula.

Positive tendencies of the wound process associated with the transition to the regeneration phase were subsequently reflected in the timing of the appearance of marginal epithelialization. In patients of the comparison group, they averaged 9.9±0.38 days. In patients of the main group, marginal epithelialization appeared on average 2 days earlier - already on the 7.3±0.27th day (Table 3.3.3).

The duration of complete healing of the pararectal wound in the main group was 19.23±1.3 days (in the comparison group 25.97±2.2). The duration of treatment in the hospital was reduced to 6.74±0.24 bed-days.

Conclusions: The main anaerobic pathogen was clostridial infection (41.1%). At the same time, it is important to note that 28 (22.6%) patients had a polymicrobial etiology of the pathological process. Escherichia coli was detected in 46.8% of cases.

1. In 22 (17.7%), involvement of the perineal muscle structures in the pathological process was noted. This category of patients was characterized by a particularly severe and aggressive course of the disease. The median area of the lesion was 160 cm2, which required extensive operations to remove necrotic tissues.

2. The connection of the abscess with the rectum was clearly established in 45 patients (36.2%). In 67 patients (54.1%), the wound or injuries communicated with the anal canal, more precisely, with its posterior wall. In 65 (52.4%) cases, it was a subcutaneous access - the probe was directed towards the anus and entered the intestinal lumen almost freely, under the skin, i.e., the fistula was intrasphincteric.

3. Clinically significant (III - V degrees Clavien-Dindo) postoperative complications requiring repeated surgery or threatening the patient's life occurred within 30 days in 21 (16.9%) patients.

4. 11 (8.8%) patients died, these were extremely severe patients admitted with septic shock. 8 patients died from intoxication against the background of the progression of anaerobic paraproctitis with damage to the large cellular spaces of the pelvis, perineum, and scrotum.

5. The use of local hydropressive ozone therapy in the complex of therapeutic measures for anaerobic paraproctitis contributed to the early cleansing of wounds from purulent-necrotic tissues (from 7.2±0.15 to 5.6±0.15 days) and the beginning of epithelialization (from 9.9±0.38 to 7.3±0.27 days) and the duration of inpatient treatment (from 31.5±2.2 to 26.5±1.3 days).

References

1. G., "Rectal Surgery," Moscow: Medicine, 2018.
2. Zimin, A. A., "Modern approaches to paraproctitis treatment," Surgery Journal, 2020.
3. Gerasimenko, A. I., "Anaerobic Infections in Surgical Practice," Surgery, 2019.
4. Filippov, K. N., "Diagnosis and Treatment of Anaerobic Paraproctitis," Russian Journal of Gastroenterology, Hepatology, Coloproctology, 2021.
5. Khuzhabayev S.T., Diagnostic and therapeutic tactics in anaerobic paraproctitis. Problems of Biology and Medicine. No. 1 (56) -2019. 37-40
6. Semenov, V. P., "Anaerobic Infections in Coloproctology," Coloproctology, 2020.
7. Melnikov, S. K., "Surgical Diseases and Their Treatment," Moscow: GEOTAR-Media, 2017.
8. Tarasov, V. I., "Surgical treatment of abscesses: anatomy, diagnosis, treatment," Journal of Domestic Surgery, 2018.