



In-Depth Review of Disease, Treatment, and Prevention of Recto-Vaginal Fistulas

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Abstract

A unpleasant ailment called a recto-vaginal fistula (RVF) is one in which the rectum and vagina do not communicate normally, allowing feces and gas to pass through. In-depth analysis of RVF, including its genesis, clinical manifestation, diagnostic techniques, accessible treatment modalities, and preventive measures, is the goal of this in-depth review paper. Twenty pertinent references from reliable sources were chosen after a thorough search of the PubMed database to support the data in this research. Congenital or acquired, the most common causes of RVFs include obstetric trauma, pelvic surgery, inflammatory bowel disease, radiation therapy, and cancer. To reduce the negative effects of RVFs on the body, mind, and society, early detection and adequate management are crucial. Endoscopy, contrast investigations, and magnetic resonance imaging are examples of diagnostic techniques. Depending on the size, location, and etiology of the fistula, the range of treatment options includes everything from conservative therapy to surgical surgery. Correct obstetric care, thorough surgical methods, proactive inflammatory bowel disease management, and radiation therapy planning are all examples of preventive tactics. Future studies ought to concentrate on enhancing diagnostic methods, perfecting surgical procedures, and identifying high-risk individuals for specialized preventive measures. In order to improve results and the quality of life for those affected by RVFs, multidisciplinary care and patient-centered strategies are essential.

Keywords: recto-vaginal fistula, etiology, diagnosis, treatment, prevention

Introduction

A recto-vaginal fistula (RVF) is an uncomfortable ailment marked by an improper connection between the rectum and vagina that allows feces and gas to pass through. It presents serious physical, psychological, and social difficulties for those who are affected, resulting in discomfort, humiliation, and a reduced quality of life. Congenital or acquired RVFs can exist; acquired fistulas are more frequent [1,2].

The genesis of RVFs is multifaceted, with a number of underlying factors playing a role in how they manifest. Obstetric trauma is a major contributing factor, especially in situations involving protracted or difficult labor, forceps or vacuum extraction, and perineal injuries. There is a chance that RVF will develop after pelvic-regional surgeries such as hysterectomies or colorectal surgery. Due to prolonged inflammation and tissue damage, inflammatory bowel illnesses like Crohn's disease and ulcerative colitis are linked to a higher risk of RVFs. Additionally, radiation therapy for pelvic malignancies can result in RVFs because it causes tissue fibrosis and impairs vascularity, both of which are factors in the development of fistulas. When determining the cause of RVF, other risk factors such as pelvic infections and trauma should also be taken into account [2,3].

RVFs can have a negative impact on a patient's wellbeing, so it's important to identify them early and manage them properly to avoid consequences. RVFs can present with a variety of symptoms, such as fecal incontinence, gas or stool passing into the vagina, and recurrent urinary tract infections, making an early diagnosis difficult. A palpable recto-vaginal septal defect and feces in the vaginal vault are frequent physical examination findings. In order to confirm the diagnosis and determine the fistula's features, a variety of diagnostic modalities, including endoscopy, contrast investigations (such as barium enema or defecography), and magnetic resonance imaging (MRI), can be helpful [4-6].

A multidisciplinary strategy comprising urologists, gynecologists, and colorectal surgeons is necessary for the therapy of RVFs. The size and location of the fistula, the patient's general health, and the underlying etiology all play a role in the treatment modality selection. For tiny, low-risk fistulas, conservative methods can be used, such as bowel rest, adequate wound care, and the use of a fecal diversion system. For larger or more complicated fistulas, surgical intervention is frequently required and may involve methods including primary repair, advancement flaps, interposition grafts, and sphincteroplasty. In a few cases, minimally

invasive techniques like transanal endoscopic microsurgery (TEM) and robotic-assisted surgeries have produced encouraging outcomes [7-10].

To lessen the burden of this uncomfortable condition, RVFs must be prevented. The risk of obstetric-related RVFs can be considerably reduced with proper obstetric care and professional monitoring during labor. Iatrogenic RVFs must be prevented by avoiding needless surgical interventions and using cautious surgical techniques. Inflammatory bowel illnesses must be aggressively managed to reduce disease activity and the ensuing emergence of RVF. In order to reduce radiation doses to vital structures, patients receiving pelvic radiation therapy should undergo meticulous planning, counseling, and education on potential side effects. The risk of postoperative RVFs can be decreased by adhering to infection control procedures during pelvic surgery and managing trauma. For fast diagnosis and treatment, patient education on early symptom awareness and prompt medical attention is essential [11-13].

A thorough investigation of RVFs, including their genesis, clinical presentation, diagnostic techniques, accessible treatment modalities, and preventive strategies, is the goal of this review paper. We intend to contribute to the understanding and management of RVFs by combining the existing body of research in this area. This will ultimately improve patient outcomes and raise the standard of living for those living with this difficult condition.

Etiology and Risk Factors

Understanding the etiology and risk factors of recto-vaginal fistulas (RVFs), which can have a variety of origins, is crucial for optimal management. The majority of occurrences of RVFs are caused by obstetric trauma, which ranks as one of the main causes. The recto-vaginal septum may be harmed by prolonged or difficult labor, forceps or vacuum extraction, and perineal lacerations [1]. There is a chance that RVF will develop after pelvic-regional surgeries such hysterectomies or colorectal surgery. Due to prolonged inflammation and tissue damage, inflammatory bowel illnesses, such as Crohn's disease and ulcerative colitis, are linked to a higher incidence of RVFs [2]. Additionally, the formation of RVFs can result from radiation therapy for pelvic malignancies, with radiation-induced tissue fibrosis and decreased vascularity playing a role in RVF development [3]. When determining the cause of RVF, other risk factors such pelvic infections and trauma should also be taken into account.

Having a thorough understanding of the individual risk factors linked to RVFs can help direct prevention measures and improve patient care. For instance, preventative steps to shorten labor, the proper use of forceps or vacuum extraction, and meticulous perineal management can all help to lower the incidence of fistulas in cases of obstetric-related RVFs [4]. The risk of RVFs can be reduced in the context of surgical procedures by using meticulous surgical techniques, accurate identification and preservation of anatomical components, and effective management of complications [5]. Aggressive medical treatment for inflammatory bowel disease patients, such as anti-inflammatory drugs and immunosuppressive drugs, can help control disease activity and lower the risk of RVFs [6]. Careful treatment planning, including the use of cutting-edge radiation techniques like intensity-modulated radiation therapy (IMRT) or proton therapy, can reduce the dose to nearby healthy tissues in the case of radiation-induced RVFs [7].

Healthcare professionals may put preventive measures in place, offer suitable counseling, and guarantee early intervention for people at high risk by understanding the etiology and risk factors linked to RVFs.

Clinical Presentation and Diagnosis

Recto-vaginal fistulas (RVFs) might show differently clinically depending on the size, location, and underlying etiology of the fistula. Fecal incontinence, the passing of gas or stool through the vagina (vaginal flatulence), and recurrent urinary tract infections are all common signs of RVFs [11]. Patients may also have foul-smelling vaginal discharge, persistent pelvic or perineal pain, and discomfort during sexual activity.

Healthcare professionals may notice particular symptoms during the physical examination that help them to diagnose RVFs. A palpable defect or gap in the recto-vaginal septum, which can be found via a digital examination or with the help of a vaginal speculum, is one remarkable finding [12]. Additionally, the "stool test," which detects the presence of feces in the vaginal vault, is seen as a telltale marker of RVFs. Gentle abdominal pressure or the Valsalva technique, which causes feces to pass into the fistula orifice, can help this observation [13].

For RVFs, an accurate diagnosis is essential for making the right treatment decisions. It is possible to confirm the existence of a fistula and identify its characteristics using a variety of

diagnostic techniques. Rigid proctoscopy and sigmoidoscopy are two types of endoscopy that can directly visualize the fistula tract and help determine its size and location [14]. To check the anatomy of the fistula and evaluate the functional characteristics of the rectum and vagina during feces, contrast tests, such as barium enema or defecography, can be used [15]. Another useful diagnostic tool is magnetic resonance imaging (MRI), which provides detailed images of the fistula and its surroundings as well as the ability to spot related problems [16].

Healthcare professionals can correctly diagnose and confirm the presence of RVFs by having a thorough awareness of the clinical presentation and diagnostic methods for the disorder. A prompt and accurate diagnosis is necessary to start the right therapeutic measures and improve patient outcomes.

Treatment Options

Recto-vaginal fistulas (RVFs) must be managed with a customized strategy depending on the unique features of the fistula, the patient's general health, and the underlying etiology. Conservative methods and surgical treatments can be used as RVF therapy techniques. For tiny, low-risk fistulas or in situations when surgical intervention is not possible or desired, conservative methods are often tried. These steps are intended to speed up the healing process, lessen symptoms, and enhance the patient's quality of life. Bowel rest, which entails limiting oral intake and starting a liquid or soft diet, can lessen fecal movement through the fistula, enabling the healing of the surrounding tissues [11]. To stop infection and encourage healing, proper wound care and cleanliness are crucial [12]. This includes routine cleaning and the application of local antiseptics or wound dressings. To divert fecal flow away from the fistula site and enable healing, the use of a fecal diversion system, such as a colostomy or ileostomy, may be taken into consideration [13].

For larger or more severe RVFs that do not respond to conservative treatments, surgical intervention is frequently required. The size, location, and characteristics of the fistula, the patient's functional state, and the surgeon's experience all play a role in the surgical technique selection. The most effective fistulas for primary repair are small, well-vascularized, and have healthy surrounding tissues [14]. Primary repair entails immediately closing the fistula tract. Advancement flaps cover the fistula hole and aid in healing by mobilizing adjacent healthy tissue, such as the rectal or vaginal mucosa [15]. When primary repair or flaps are not an option, interposition grafts, such as a muscle or tissue flap, can be utilized to close the

space between the rectum and vagina [6]. When the sphincter complex has been disrupted by the fistula, sphincteroplasty—a treatment to repair or recreate the anal sphincter muscles—may be required [17].

Minimally invasive techniques have grown in favor in recent years for the treatment of RVFs. Transanal endoscopic microsurgery (TEM) enables accurate repair with lower morbidity and quicker recovery times by allowing for precise viewing and manipulation of the fistula site [18]. Utilizing robotic surgical equipment, robotic-assisted treatments provide increased dexterity and visualization, enabling complex repairs with better results [19,20].

The best treatment option for RVFs should be chosen on an individual basis, taking into account the patient's preferences and general health as well as the unique features of the fistula. For people with RVFs, a multidisciplinary strategy comprising urologists, gynecologists, and colorectal surgeons is necessary to provide complete care and improve treatment results.

Prevention Strategies

Recto-vaginal fistulas (RVFs) must be avoided in order to lessen the severity of this painful ailment. RVFs can be reduced and patient outcomes can be enhanced by implementing appropriate preventive measures. In various clinical circumstances, a number of important preventive measures should be taken into account.

Preventing obstetric-related RVFs in the obstetric context depends in large part on providing adequate prenatal care, expert labor monitoring, and prompt intervention in situations of prolonged or obstructed labor. Pregnant women can become more aware of the dangers and potential problems of labor and delivery through adequate prenatal counseling, which can also help them make well-informed decisions. To reduce the risk of perineal damage and subsequent fistula formation, trained practitioners should provide appropriate guidance when using assisted vaginal delivery techniques, such as vacuum extraction or forceps [11].

Adherence to rigorous surgical techniques is essential for surgeries on the pelvic region to avoid iatrogenic RVFs. To reduce the risk of unintentional rectal or vaginal injury, surgeons should perform rigorous dissection, careful identification and preservation of anatomical components, and suitable closure procedures. In complicated situations, using specialized

techniques like intraoperative imaging or safety barriers (such ureteral stents or vaginal packing) might add to safety precautions [12].

To reduce disease activity and eventual RVF development in people with inflammatory bowel disorders (IBD), active therapy of the underlying ailment is essential. This entails maximizing medical treatment, such as the use of immunosuppressive and anti-inflammatory drugs, to limit the chance of the development of fistulas and control inflammation [13]. Potential problems can be identified and treated early on with the use of close disease activity monitoring and routine follow-up visits with gastroenterologists.

To reduce the danger of RVFs during radiation therapy for pelvic cancers, proper treatment planning is necessary. Radiation oncologists should use cutting-edge methods to give accurate radiation doses while protecting healthy surrounding tissues, such as intensity-modulated radiation treatment (IMRT) or proton therapy [14]. To reduce radiation-induced damage to the recto-vaginal septum, dose restrictions and tissue tolerance recommendations should be followed.

Preventing postoperative RVFs requires strict adherence to infection control procedures during pelvic surgeries and trauma treatment. Postoperative infections that could lead to the development of fistulas can be considerably decreased with the use of suitable sterilization methods, stringent aseptic procedures, and antibiotic prophylaxis. Prompt and appropriate management, such as wound care, bleeding control, and infection prevention, can reduce the likelihood of fistula development in situations of pelvic trauma [15].

RVFs must be avoided by patient education on early symptom recognition and the significance of promptly seeking medical assistance. Campaigns to raise awareness, patient education materials, and educational initiatives can help people identify probable RVF symptoms including fecal incontinence or gas passing through the vagina and seek early medical attention [16-20].

In conclusion, lowering the occurrence of RVFs requires the implementation of preventative measures that are specifically adapted to the relevant clinical scenario. Key elements of these preventive strategies include proper obstetric care, thorough surgical methods, proactive management of inflammatory bowel disorders, and radiation therapy planning. RVFs can be

reduced and patient outcomes can be enhanced with a comprehensive strategy that incorporates patient education, interdisciplinary teamwork, and adherence to best practices.

Future Perspectives and Research Directions

Recto-vaginal fistulas (RVFs) still require a great deal of understanding and management, which calls for ongoing research and the discovery of new directions. To improve current methods and create new ones, more research is required on the etiology, pathophysiology, diagnostic techniques, and available treatments. Additional risk factors and potential preventive interventions may be found with more research into the genesis of RVFs. RVF development can be examined over time in longitudinal studies that look at the effects of particular obstetric procedures, surgical methods, and radiation therapy settings. Research into the mechanisms of tissue fibrosis and healing in RVFs at the molecular and cellular level may result in targeted therapies and regeneration methods [11-15].

Accurate and prompt identification of RVFs depends on advancements in diagnostic techniques. High-resolution ultrasound and functional MRI are two examples of recent imaging technology developments that show promise for improving the identification and characterization of fistulas. Clinical practice may be transformed by the creation of biomarkers or particular imaging probes that can help with RVF diagnosis and monitoring.

Comparative studies comparing the effectiveness and results of various surgical procedures, such as primary repair, flaps, grafts, and minimally invasive approaches, are required in terms of treatment. For the best possible patient treatment, it is crucial to conduct long-term follow-up studies that evaluate functional results, quality of life, and the effects of interventions on continence and sexual function. Investigating cutting-edge therapy methods, such as regenerative medicine and tissue engineering, may provide alternative treatment options for RVFs. Further research is needed to determine how stem cells, growth factors, and biocompatible scaffolds might be used to encourage tissue regeneration and fistula closure. Additionally, cutting-edge methods like biofabrication and 3D printing have the potential to provide difficult RVF situations with customized treatment options [1,8,9,12].

Progress in RVF research depends on collaboration between researchers, physicians, and patients. The gathering of larger datasets and the generalizability of results can both be facilitated by multicenter studies and multinational collaborations. Improved patient

satisfaction and overall care may result from patient-centered research that focuses on comprehending the psychosocial effects of RVFs and patient preferences for available treatments.

To summarize, continued research is necessary to advance the study of RVFs. We can continue to improve the management of RVFs and ultimately improve the lives of those affected by this difficult condition by examining the etiology in greater detail, improving diagnostic procedures, investigating new treatment modalities, and involving patients in research.

Conclusion

Recto-vaginal fistulas (RVFs) are a severe burden for those who have them and necessitate early detection, adequate care, and preventive measures. A thorough assessment of the condition, including its origin, clinical manifestation, diagnostic techniques, possible treatment modalities, and preventive measures, has been provided in this review study. More investigation is required to improve diagnostic methods, hone surgical techniques, and pinpoint risk factors for the emergence of RVF. In order to maximize outcomes and raise the quality of life for those who are afflicted by RVFs, patient-centered approaches and multidisciplinary care must be integrated.

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