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Research Article

FUNCTIONAL RESULTS FOR ULTRA-LOW RESECTIONS OF THE RECTUM

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ABSTRACT

Introduction The understanding of the mechanisms concerning fecal continence has undergone a considerable impulse due to the need to reduce demolition interventions with the possibility of a definitive colostomy. (1,2,3,4) The rectus responsible for the accumulation of faecal material up to moment of defecation does not need a rectal peristaltic activity. The aim of the present study is to evaluate and analyze the functional modifications of ano rectal continence after restoration of intestinal continuity by packaging an anastomosis on the rectal abutment, or in anal colo or on the combed line. **Materials and methods:** From January 2010 to December 2017 consulted the database of the AOU polyclinic University of Catania were observed in 25 cases of neoplasia in the rectum and in 6 cases of colon neoplasia with seat: sigma (6.2%) studied at the Department of Medical Surgical Sciences and specialist II Patients selected for this analysis had a mean age of 72 years (range 74-70). All patients performed digital exploration of the rectum. The colonoscopy (fig 1.) the diagnostic imaging (CT and MRI) with which it obtained the staging of the neoplasms if. The TNM, subsequently the therapeutic path was completed by implementing the manometry. **Results:** The removal of cancer of the rectum is associated with the removal of the middle rectum and its pedicle until the origin of the inferior mesenteric artery exposes to the risk of nerve lesions with consequences on the sensibility of the residual rectum, on the sphincter function but also on the function bladder. The instrumental examinations were conducted after 6- 15-36 months from the surgical treatment. In the group of patients undergoing a curative intervention that included rectal colic anterior resections with mechanical or manual anastomosis in 16 cases (64%) and in colon anal interventions in 4 cases (13%), I noticed a variable reduction in basal sphincter tone , of the new rectum compliance only in the first 6 months post-intervention. **Discussion:** Anterior resection of the rectum involves a variety of specific symptoms such as increased frequency of evacuations, a different mode of defecation, urgency, difficulty with evacuation and continence disorders. The main causes are the decrease in the capacity and the compliance of the rectum, an alteration of the tone of the internal anal sphincter and the loss of the injured anal rectal reflex. The factors that influenced the lifestyle were: the excessive frequency, fragmentation and the incontinence. The incidence of functional disorders reached 90% in the first 6 months of the postoperative period to improve within 1-2 years. **Conclusion:** The saving of sympathetic and parasympathetic nervous structures represents the measure for the best conservation of the urinary and faecal containment and expulsive function. Attention to at least partial preservation of the internal sphincter and total removal of the rectum associated with current reconstruction techniques contribute to the reduction of the evacuation disorders of the sphincter function before and after the operation.

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INTRODUCTION

The understanding of the mechanisms concerning fecal continence has undergone a considerable impulse due to the need to reduce demolition interventions with the possibility of a definitive colostomy. (1,2,3,4) The rectus responsible for the accumulation of faecal material up to the moment defecation does not require rectal peristaltic activity. The use of a reservoir can be attributed to the capacity of the rectum of increasing fecal volumes without proportionally increasing the anal rectal pressure. Due to the muscular component to accommodate new volumes of relaxation. (5,6,7,8) The ability to transmit sensory information of rectal replenishment does not depend on the presence of the rectum but from the snow

terminations present in the anus muscle elevator such specific receptors and nerve fibers transport the sensation of rectal distension following parasympathetic , the branches until the confluence of the sacral plexus. the surgical treatment of the rectum of the under peritoneal rectum has imposed the affirmation of therapeutic protocols that provide for the preservation of the sphincter function, this has led to the need for control over time of the functional results in terms of anal rectal continence (9,10, it is of fundamental importance to diagnose any misunderstood functional deficits that become manifest after the surgical treatment up to invalidate the functional results of the sphincter conservative surgery. (11,12,13) The interventions that involve the total or total sub rectal resection modify the rectal compliance that decreases as

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low and the anastomosis results in an increase in daily defecations. The aim of the present study is to evaluate and evaluate the functional modifications of ano rectal continence after restoration of intestinal continuity by packaging an anastomosis on the rectal abutment, or in anal colon or on the combed line

MATERIALS AND METHODS

From January 2010 to December 2017 consulted the database of the AOU Polyclinic University of Catania were observed in 25 cases of neoplasms to site in the rectum in 6 cases of colon neoplasms with seat: sigma (6.2%) studied at the Department of Medical and Surgical Sciences II The patients selected for this analysis had a mean age of 72 years (range 74-70) The clinical signs that s in patients observed at the clinical examination were: blood in the stool accompanied by diarrhea and constipation , asthenia, rapid weight loss and anemia. All patients performed digital exploration of the rectum. The colonoscopy. The diagnostic imaging (CT and MRI) with which it obtained the staging of the neoplasms if. The TNM, subsequently the therapeutic path was completed by implementing the manometry (fig 1,2)



Fig 1 electrodes



Fig 2 Infusion pump

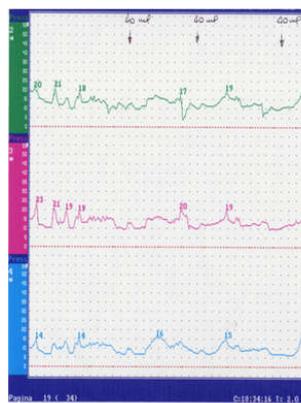


Fig 3 Traced EMG

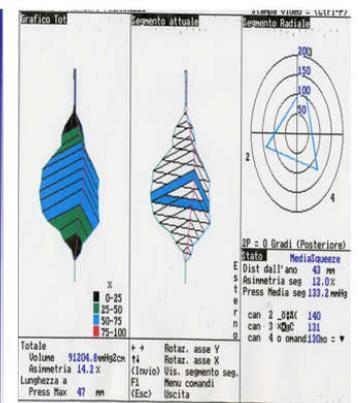


Fig 4 contraction activity

which evaluated through catheters to continuous perfusion of morphology varies with balloons of different volume the functions of the internal anal sphincter, external and the anal rectus reflex before and after surgery. Electromyography (fig. 3,4) that studied neuromuscular dysfunctions of nervous or myogenic origin by measuring the resting potentials and during the contractile activity of the muscles in order to check the degree of validity of the sphincter activity in the preoperative, highlighting the presence of nerve lesions and in postoperative eventual iatrogenic damage on the sphincter complex and nerve fibers, through the insertion of bipolar, needle-shaped concentric electrodes inserted in the external anal sphincter, or in the rectal muscle. process diagnostic. Through opaque substances they allowed to evaluate the anal rectum angle in basal conditions and during the evacuation. . The conservative surgery operations of the sphincters performed were the RA anterior or mechanical or manual r resection, the colon anal anastomosis, the by anal, and the pull -through (bacon black) and finally the sphincter trans. In all patients the total or sub-total resection of the rectum was performed.

RESULTS

The removal of rectal cancer is associated with the removal of

the middle rectum and its peduncle until the origin of the inferior mesenteric artery exposes the risk of nerve lesions with consequences on the sensibility of the residual rectum, on the sphincter function but also on the bladder function. To evaluate the functional results of the evacuations after ultra-low resections we have adopted the classification of Parks 1 normal, 2 difficulty in the control of gas and diarrhea 3 loss of liquid stool 4 loss of normal stools. The analysis of the results was carried out in the preliminary phase with the compilation of a questionnaire in which it was possible to obtain information on the functional results with a report of the evacuative frequency. The electromanometric controls with the manometric evaluation were performed with a pneumo-hydraulic perfusion manometer in which the basal and contractile sphincter activity and their sensitivity were evaluated. In all tests the basal sphincter tone was altered with an average value of 37.2 mmHg (reference values 40-80 mmHg), symmetrical on all channels. HPZ (High Pressure Zone) length of 1.4 cm (norm 2-4.5cm) with average pressure values of 31.6 mmHg. (norm 40-120 mmHg). Voluntary contraction decreased in average increments of 47.4 mmHg (reference values 105-261 mmHg). RIAR present.

Anal rectum compliance: F.S. (first sensation) normal at 50cc (v. <40cc), constant stimulation sensation (CS) at 80 cc (see 50-60cc) and Maximum Volume Tolerated (MTV) at 120cc (v.v 200-600 cc). The instrumental examinations were conducted after 6- 15-36 months from the surgical treatment. In the group of patients undergoing a curative intervention that included rectal colic anterior resections with mechanical or manual anastomosis in 16 cases (64%) and in colon anal interventions in 4 cases (13%), I noticed a variable reduction in basal sphincter tone , of the new rectum compliance only in the first 6 months post-intervention. the reduced tonic sphincter activity and the absence of the vascular-rectum inhibitory reflex did not allow to retain small faecal volumes both from the reservoir and from the intestinal lumen, since the latter were free to transit without being sensed by either the at receptors or the transactional nerve endings discrimination of the content this favored the soiling both during the waking state and especially during sleep. The complete functional recovery was obtained in 70% of cases treated within 15 -36 months of the operation. Sphincter functional recovery was slower (36 months) in patients whose anastomosis packaging was 2 cm from the anal fissure. In the remaining 30% there was good continence but the defecatory frequency exceeded three times a day. after 36 months it was possible to observe, with functional

investigations, the recovery of the internal sphincter, the adaptation of the external sphincter and the improvement of the anal-rectum sensitivity, as the rectal angle was conserved within the maximum limits. 10% of this group was incontinent. In these cases we have found the presence of iatrogenic lesions due to both the technical difficulties of execution or in the enlarged exeresis conducted for the purpose of oncological radicality (radical lymphadenectomy). Incontinence phenomena with increasing gravity were highlighted with the lack of control for gas or stool. Liquid, but never for solid stools. In patients with anal anastomosis and colonic reservoir (5cm from the anal rhyme) in 6.5% the mean defecation rate was 2 times a day and spontaneously began, in the remaining group of patients (7-9 cm from the anal rhyme) 6, 5% the urge to evacuate was caused every 2 days by an anemia. In patients who performed an anastomosis without reservoir (n 23 cases equal to 76.5%) the analysis of the results was carried out in the preliminary phase with the compilation of the questionnaire with which it was possible to evaluate the functional results of the evacuative frequency in average up to 2 times a day. After 6 months we performed the electromanometric checks. The manometric evaluation showed again an evident sphincter hypotonia the traces performed between 16.36 months baseline sphincter activity and the contractile activity normalize to detection. With the pull-through techniques (bacon, black) n 3 cases equal to 9%. We obtained positive responses in relation to the extension of the exeresis. Anal sensitivity depended on the integrity of the transactional mucosa and in the exeresis with pull-through technique there was a sensory deficit with the impossibility of discriminatory recognition of the solid, liquid rectal content. Gaseous, which was directly proportional to the extension of the mucosectomy so that the recovery of sensitivity was faster in patients with less extension.

DISCUSSION

The anterior resection of the rectum involves a variety of specific symptoms such as increased frequency of evacuations, a different mode of defecation, urgency, difficulty in evacuation and continence disorders. The main causes are the decrease in the capacity and the compliance of the rectum, an alteration of the tone of the internal anal sphincter and the loss of the injured anal rectal reflex. (13 14) The factors that influenced the lifestyle were: the excessive frequency, fragmentation and the incontinence. The incidence of functional disorders reached 90% in the first 6 months of the postoperative period to improve within 1-2 years with a decrease in the capacity of the new rectum and the alteration of sensitivity. (15 16) An incorrect mode of defecation that was reported in the questionnaire in 54%, urgency in 60% and an obstructive defecation in 10% after resection of the rectum. (17,18) the sensation of fullness of the rectum was present on average one year from exeresis in all patients undergoing anterior resection. the manometric evaluation in the previous mechanical or manual resections showed that the anal endo fall was due to direct iatrogenic damage on the anal sphincter, therefore the most reliable hypothesis of the origin of the sphincter damage was the probable maneuver of rectal eversion performed to facilitate the execution of colon anal anastomosis, resulting in a lesion of a nerve fiber (n pudendo) or direct damage to the muscle fibers (19,20) However, nerve lesions do not always occur in a complete section of the nerve fiber, but a

simple excessive traction can lead to a functional deficit (neurological praxia) even if transitory, with restitutio ad integrum in a period of time ranging from a few weeks to a few months, as in our observation. (21,22) The suture was also questioned when the latter being close to the combed line most likely to cause an internal sphincter lesion (23,24). Often a modification of the pelvic floor to which a modification of the ano-rectal angle was associated.(26,27) the surgical intervention, although generally does not modify it, makes potential incontinence manifest, especially when this perineal prolapse is associated with the deficit of the external anal sphincter. (28,29,30) For which it is useful to highlight the prolapse of the perineum underneath plan in the preoperative. (31,32) Under the anatomical-functional profile the nerve lesions can be distinguished in: 1 parasympathetic lesions; 2-sympathetic lesions; pudendal nerve injuries. The similar sympathetic nerve runs along the erect nerves that through the sacral foramina reach the pelvis and the inferior hypogastric plexus located at the front and lateral to the rectum, immediately above the endopelvic fascia that covers the elevating muscles of the anus. (33,34) Lesions at the lower hypogastric plexus level may occur during pelvic lymphadenectomy or during traction, which is performed on the lower portion of the rectum and result in bladder atony resulting in a retention of urine. (36,37,38) On the anal sphincter apparatus the influence is on the internal sphincter for the role of modulator of the sympathetic function. (39,40) The sympathetic thoraco-dorsal artery runs into the hypogastric plexus at the level of the aortic bifurcation immediately below the parietal peritoneum, and divides into the hypogastric nerves that run parallel to each artery, medially to the ureter. (41,42,43) A lesion of the hypogastric plexus is possible during an aortocaval lymphadenectomy, during the preparation of the inferior mesenteric artery, while the need for a high lateral dissection can compromise the hypogastric nerves. In the anal rectum the sympathetic thoraco-dorsal behaves similarly with an action of contraction on the internal anal sphincter and of relaxation on the rectal musculature. (44,45,46,47) One of his lesions has a negative influence on the basal sphincter tone and on the function of continence, but contributes to a reduction in the compliance of the residual rectal stump. Lesions of the sympathetic lead to a condition of detrusor hyper reflective for the action of sympathetic terminations on the alpha receptors at the level of the trine (contraction), and on the beta receptors at the detrusor level (release). (48,49,50,51,52) The pudendal nerve lesions are more rare, due to its course in part below the anus lift, but possible in case of low or very low anterior resection, and that may involve alterations of bladder, anal-perineal sensitivity and above all of the function of the striated sphincter.

CONCLUSIONS

The saving of sympathetic and parasympathetic nerve structures is the measure for the best conservation of the urinary and faecal containment and expulsive function. The attention to at least partial preservation of the internal sphincter and the total removal of the rectum associated with current reconstruction techniques contribute to the reduction of the evacuation disorders. The sphincter function before and after surgery was documented by the clinical anamnestic questionnaire in which the degree of continence in the faeces

and gases, the ability to discriminate the solid or liquid content. The study was integrated with the manometric examination that documented how from the six months patients had a good continence over 70% of cases treated minor disorders were highlighted by a partial and incomplete lesion of the thoracic dorsal nerve or muscle fibers of the internal syndromes with a reduction in compliance and continence in the residual rectal abutment. A transient functional deficiency of the duration between 12-24 months from treatment,

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