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ASPECTS OF SEXUAL DYSFUNCTION AFTER RADICAL SURGERY OF RECTUM CANCER

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Abstract
Background: Rectal cancer became an important health problem in the past years in Romania. An improvement in oncological results after major surgery for this disease became reality. Unfortunately the quality of life after this radical oncological surgery was not studied.
Method: In order to appreciate the quality of life of a group of Romanian ostomates after abdominoperineal resection we used four items from the City of Hope & Beckman QOL test (Duarte USA). 25 patients (11 males and 14 females) accepted to give answers to our questions. The items concerned their sexual activity before surgery, the decrease of this activity after surgery and stoma creation; satisfaction after sexual activity as ostomate. Males were asked to answer a forth question concerning erectile dysfunction.
Results: Both males and females recognized an acceptable life before surgery. The decrease and the quality of sexual life after surgery were recognized by males, but especially by females. More than one third of males recognized erectile dysfunction after surgery. A connection between quality of sexual life and accuracy of surgical techniques used during operation is considered to be relevant. Further studies must be performed in order to achieve better progress.

Key words: *quality of life, sexual function, rectal cancer, type of surgery.*

1. Introduction

Beside the fact that it represents from an epidemiological point of view, a serious health problem (mainly by its frequency), rectal cancer is a permanent challenge for the oncological practice. It is the problem of the exigency of disease control as well as a problem of long time survival. Undoubtedly these two exigencies are answered nowadays with remarkable results that may lead to substantial progress [1]. These exigencies have been these years complemented by a third dimension represented by the quality o life. The sexual and the urogenital functions represent parameters expressing quality of life after surgery. Its estimation is a constant in many countries with developed medical systems. The purpose of the studies conducted in this respect as to

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model the therapeutic act in order to obtain a maximum benefit for the patient. The way of reaching this target starts form the identification of sexual problems signaled by patients who had the disease and were treated for it.

The analysis performed are complex and start from the morph-functional bases, go through characterizing the effects of therapy on sexual function (in close connection with the effect of therapy on the control systems of the sexual function) and they end with the patient's perception of their post-therapeutic condition (be it good or bad). As far as we know such studies have not been performed in Romania up to now, so the general data of the present study must refer to foreign studies.

2. Morphological aspects of Uro-Genital Innervations

In what follows we will be referring to "classical" anatomic data regarding rectal and urogenital innervation (which are actually a complex) as well as to more recent studies meant to explain the effects of surgical excisions on genital and urinary functions. Urogenital innervation is autonomic and belongs both to the sympathetic and parasympathetic systems. As to rectal innervation we are just going to make some brief comments based on the fact that genito-urinary innervation has the same origins as rectal innervation. We are talking, obviously, about the vegetative innervation made up of sympathetic and parasympathetic fibers. To this is added a somatic component having a sensitive, as well as a sphincter-control function [2].

Urogenital innervations are autonomous and has as we said above a sympathetic and a parasympathetic component [3]. The two components come together in a common pelvic plexus out of which emerges the cavernous nerve.

The sympathetic component has its origin at the level of the T11, T12 and L1 neuromers out of which emerge preganglionar fibers that pass thorough the sympathetic prevertebral lumbar complexes in order to form on the front of the aorta, the upper hypogastric plexus located between the origin of the lower mesenteric artery and the bifurcation of the aorta. From this plexus emerge at the level of the bifurcation of the aorta the right and left hypogastric nerves that go in the direction of the pelvic plexus on a trajectory parallel and medial to that of the ureters and tangent to the mesorectum.

The ejaculation function is under sympathetic control.

The parasympathetic components originate in the front roots of the S2, S3 and S4 neuromeres. From these neuromers emerge the erecter nerves on the front of the pyramidal muscles of the pelvis. Identifying them during surgical dissection is difficult. These nerves run toward the pelvic plexus as well. According to some classic studies the pelvic plexus also known as the lower hypogastic plexus is located at the level of the sacro-recto-genito-pubic lamellae, latero-rectal connective structures having an anteromedial direction, situated in the front of the lower third of the rectum according to some anatomists, Papilian among them [4]. Other anatomists contest the existence of these conjunctive condensation structures. They rely on some recent dissection studies.

The sacral parasympathetic is responsible for the erection.

The anastomoses between the sympathetic and the parasympathetic network (hypogastric and the erector nerves) is achieved within an Y configuration.

The cavernous nerves get detached from the pelvic plexus (hardly identifiable and implicitly dissectible) that goes towards

the posterolateral margins of the prostate. Their lateral and front position to the rectum renders them vulnerable to lesion during low rectal dissection. Recent studies of pelvis neuroanatomy have allowed for a better distribution of what is called the ”pelvic nerve”, a complex of nerves emerging from the inferior hypogastric plexus under the form of a nervous network that innervates the pelvic viscera. Its' damaging during dissection in rectal surgery is correlated with bladder dysfunction but with erectile dysfunction as well [6] and this finding completes the correct understanding of the urogenital dysfunction after the complete and radical surgery of rectal cancer.

One anatomic structure that is not nervous but has an essential role in determining urogenital dysfunctions after rectal surgery is Denonvillier's fascia. It is admitted that this anatomic structure represents the limit of the excision of the front mesorectum being the dissection plane that allows the conservation of the urogenital innervation at this level.

3. Functional consequences of major rectal cancer surgery

These consequences result from potential nervous sacrifices due to rectal dissection. They are both sexual an urinary. The male sexual ones include erectile and ejaculatory disfunction. With females the dysfunction often manifest itself through dyspareunia. The few fine-grained analyses have also indicated other kinds of malfunction of vaginal sensitivity and of orgasm. Besides post-surgical anatomical lesions other factors intervene as well, such as diabetes, atherosclerotic vasculopathy or senile involution. As we showed above and summarize here lesions of the sympathetic nerve determine ejaculatory dysfunctions those of the parasympathetic nerve erectile dysfucntions of the bladder but also erectile dysfunctions. As the frequency of these dysfunctions it is estimated that they are more numerous after abdominoperineal resection (APR) compared to conservative resections [7, 8] but the more recent practice of ultra-low resections modified these estimates to a certain extent.

Urinary dysfunctions are estimated by some authors [9] at 31% but they are highly reversible. This reversibility is mainly correlated with the lengthening of the hypogastric nerves of the pelvic plexus and the cavernous nerves and less with complete lesions of these structures. A preoperative evaluation of urinary dysfunction in the case of major intervention for rectal cancer is considered essential for a correct appreciation of a potential post-op urinary dysfunction.

Quantifying these consequences is not easy since it presupposes correlating a constant state at a certain post-op moment with a state before the surgery.

Within surgery practice, the progress in understanding the function and morphology of urogenital innervation was reflected in the possibility of establishing limits of rectal resection which, when observed present nervous lesions and their consequences. These limits are established in all the four planes of dissection: posterior, anterior and lateral (right and left).

The validity of these limits has been confirmed as a result of the introduction of the concept of total mesorectal excision by Heald [11] and of the validation of his results both oncologic and functional at the level of the urogenital system.

In conformity with established consensus posterior dissection must be performed outside the rectum fascia proper at the level of the adjacent lax conjunctive tissue. This kind of dissection can be performed by sharp dissection, so that the mesorectum can be removed while the sympathetic innervation is spared. Anterior dissection is much more delicate due to the sensitivity of the anatomic structures that must be identified and to the

risk of missing these structures as a consequence of difficulties in identifying them during surgery. Conceptually there are three situations.

The first one it is the resection tangent to the rectal muscular fibers, inside the mesorectum. It is considered to be insufficient from an oncologic point of view.

The second one it is the dissection at the level of the rectum fascia proper (which is performed right outside of it) and logically and anatomically this is the most judicious being a continuation of posterior anatomic dissection which also allows mesorectal excision. This is the best solution for most rectal cancers.

The third situation is constituted by resection of Denonvilliers' fascia (an extramesorectal excision) which can lead to lesions of the cavernous nerves.

Oncologically and functionally the best solution is considered the complete excision of the mesorectum.

Lateral dissection has been significantly reappraised lately. Its' importance diminished with the acceptance of anastomic studies that minimize the importance of the lateral ligaments of the rectum and of the middle rectal arteries. So lateral dissection outside the mesorectal plane consequent on upward and medial tractions of the rectum is thought to potentially cause lesions to the pelvic plexus [5]. A similar opinion (accepting the fact that usually carcinological lateral dissection thoroughly conducted is possible while concerning the pelvic plexus) has also been expressed by Yeager a while ago [12]. The search for a morphological foundation for the criteria that must be observed in order to obtain the conservation of urogenital functions after major rectal surgery has also led the way toward establishing the premises for a correct evaluation of post-op results from the point of view of the patients' life quality [13, 14].

The instruments that rendered this evaluation possible and believable are the tests of life quality. Both their making up and the methodologies of their interpretations as well as the drawing of some conclusions were the result of some remarkable evolution in the science of the correlation between medical practice and its general effects on the patient's life. Among the results of these studies we mention the characterization of the erectile function and of the female sexual function by means of an index suggested by Rosen [15].

The list of the tests suggested as study instruments on life quality following rectal cancer is a rich one and comprizes genuine questionnaires such as SF-36, specific disease questionnaires (EORTC; QLQ- CR38; FACT-C) as well as questionnaires specific of cancer (EORTC; QLQ=C30) which are considered believable and scientifically valid.

4. The framework of this study

In Romania there has been little concern for the patients' life quality after rectal cancer surgery. Among the works that approach this problem we find the two monographies edited by Pop [16, 17]. References are made therein to the life quality of ostomates subsequent to rectum amputations. We may say that the subject has often been avoided and the expression of this phenomenon is the reluctance the ostomates show when speaking about their situation. That made the analysis of some delicate aspects as for example post surgery sexual dysfunction even more difficult. However, we have considered that such a study is necessary despite the difficulties in realizing the test.

5. Material and method

25 ostomates have been under study. They accepted to answer a questionnaire concerning life quality. The questionnaire was created by the research institute City of Hope &.Beckman of Duarte USA that

has agreed to permit the use of the questionnaire.. It is a questionnaire that has produced its value being used uninterruptedly since 1983. Questions 24, 25, 26 and 27 referring to sexual activity have been selected. The answers to the questions were in terms of Yes/No. The patients were informed about the strict anonymous character of the questionnaire and we told them that they were free to answer or not and that they are not obliged to answer all the questions. There was no intrusion into the moment the answers were formulated.

The general characterization has shown the following distribution: men 11, women 14 (Fig. 1).

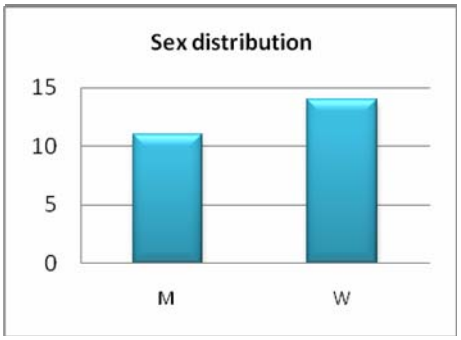

Fig. 1. *Sex distribution*

Age group distribution was regarded from perspective of the threshold of seventy, considered as a physiological threshold for a normal sexual function especially with men. The distribution on the entire group was as follows: 22 patients under 70, and 3 older than 70.

Age group

Among the 11 men, 8 were under 70 and 3 were older (Fig. 2)

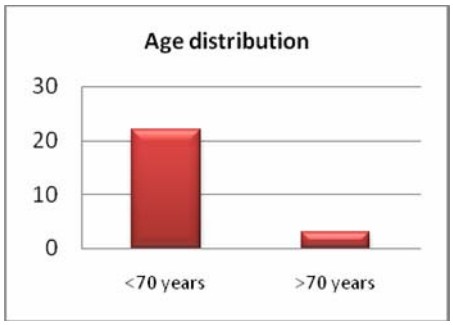

Fig. 2. *Age distribution*

The whole group of women was under 70.

Concerning marital status, the situation at the level of the whole group was as follows: married 17 (68%), single 4 (16%), widowers 3 (13%), divorced 1 (4%), as it is shown in Fig. 3. With a view to this distribution and considering the features of the life style in our society, we can estimate that the majority of the subjects have enjoyed favorable conditions for a good sexual life.

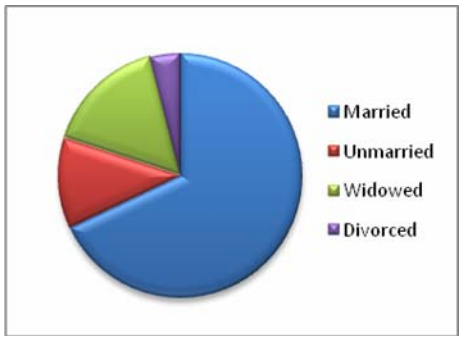

Fig. 3. *Marital status*

All the patients were subject to an abdominoperineal resection. 23 had rectal cancer, one a multiply malignant rectocolic polyposis and one an irreversible rectal functional alteration after an unfavorable evolution of a rectovaginal fistula (Fig. 4).

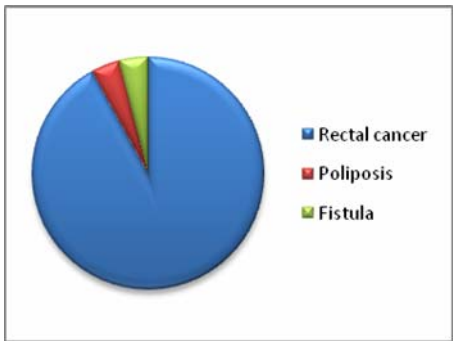

Fig. 4. *Distribution after the disease*

24 were subject to APR and in one case a pancoloproctectomy was performed. That means the study comprised 24 colostomies and one ileostomy (Fig. 5).

Difficulties concerning the knowledge of the medical particular situation of each patient were encountered. We were surprised to realize that many of them did not posses clear information about the disease that has caused surgery nor did they find necessary to keep the medical documents concerning the surgical procedure they had been subjected to.

The estimation of the type of intervention practiced for APR also turned out to be difficult. A general documentation on the options of surgical technique has led as towards considering that usually dissection was made to the variant of posterior dissection performed by digital cleavage in the presacral spaces, the anterior one presupposed the removal of Demovilliers fascia while the lateral dissection was performed based on the acceptance of the existence of rectal wings as dense vascular structures that must be sectioned by ligatures between two forceps. This type of technical approach must be correlated with morphological and functional implications that were presented above [16].

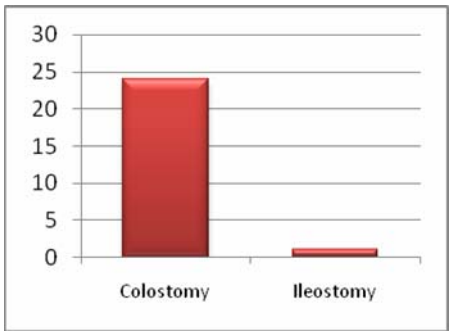

Fig. 5. *Stoma type*

The 25 subjects who agreed to participate in the study were invited to answer the following three questions extracted from the City of Hope & Beckman test:

-Were you sexually active before surgery?

-Did you reduce your sexual activity since you were stomized?

-Is your sexual activity satisfactory?

Male subjects were invited to answer a further question:

-As a man do you have erection problems or problems in achieving?

Here are the answers to the questionnaire both at the level of the entire group and of the two sex subgroups: 4 subjects refused to answer the first item. Out of the 21 who answered, 16 (76.19%) said they were active before the surgery, while 9 (23.81) said no (Fig. 6).

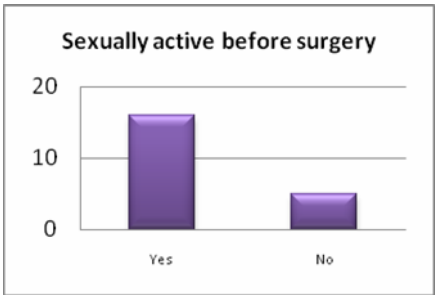

Fig. 6. *Patients sexually active before surgery*

The second question referring to diminished sexual activity after surgery: there was 12 subjects who answered positively (57.14%) and 9 (42.85%) who answered negatively (Fig. 7).

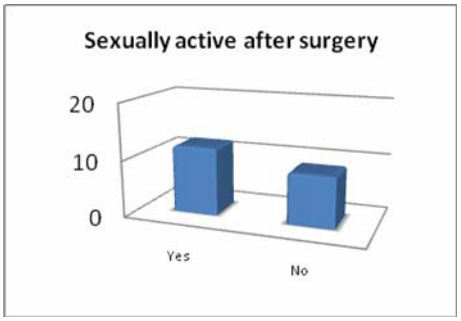

Fig. 7. *Patients sexually active after the surgery*

The third question that required an answer whether the sexual activity is found satisfactory after surgery was accepted by only 17 subjects (8 answered positively and 9 negatively) (Fig. 8).

Fig. 8. *Distribution of satisfactory sexual activity after the surgery*

At the level of the male subgroup 8 (88.88%) out of the 9 respondents say they were sexually active before surgery.

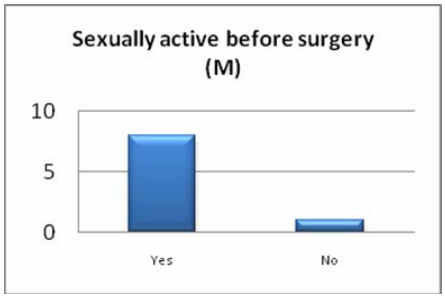

Fig. 9. *Sexually active men before surgery*

After the surgery (item 2) 4 (44.44%) of the same number of 9 respondents considered that they remained active to the same degree while 5 (55.66%) affirmed the opposite (Fig. 10).

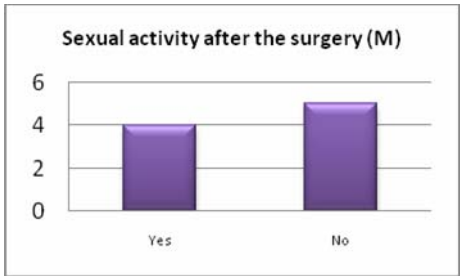

Fig. 10. *Sexually active men after the surgery*

Item 3 referring to the degree of satisfaction offered by sexual activity implying positive answers from only 3 subjects (37.5%) (Fig. 11).

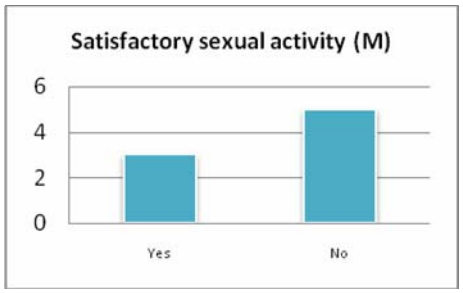

Fig. 11. *Distribution of satisfactory sexual activity after the surgery in men's group*

It is also 8 subjects who answered the question about erection problems. Between them 3 (37.5%) admit erectile dysfunctions (Fig. 12).

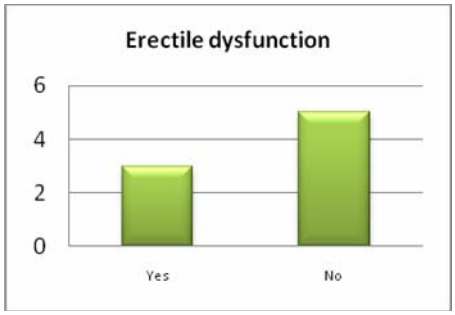

Fig. 12. *Distribution of erectile dysfunction after*

In the female subgroup all the 12 persons answered positively to the first question. 8 (66.66%) considered they were sexually active before surgery (Fig. 13).

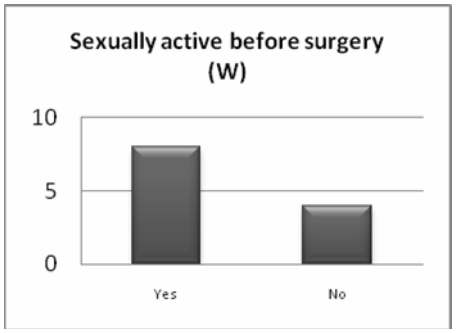

Fig. 13. *Sexually active women before surgery*

After surgery, 8 (66.66%) of the 12 respondents said they have reduced their sexual activity (Fig. 14).

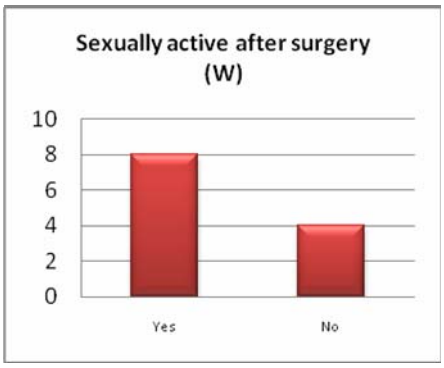

Fig. 14. *Sexually active women after the surgery*

Wherever 5 of the 9 who answered the question referring to their considering satisfactory the sexual activity after surgery answered positively (Fig. 15).

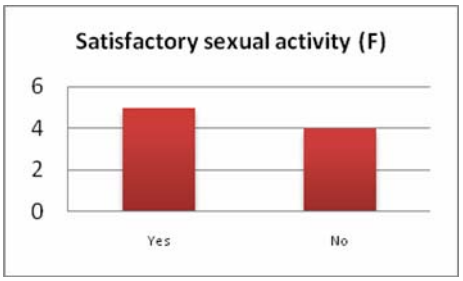

Fig. 15. *Distribution of satisfactory sexual activity after the surgery in women's group*

Results and discussions

The present study reveals that under the conditions of the effort to engage the patients who have been subject to major rectal surgery in a process of appreciating life quality after surgery is possible and this activity leads to valuable and useful conclusions from a practical point of view. Recourse to already validated formulas such as questionnaires already in use and checked allows for considerations nearer to reality.

Even if it is poor considering the number of participants the present study permits a radiography of the situation of those patients including the state of their sexual problems.

Both men and women took part in the study. Their ages varied and so did their biological condition.

They agreed to answer sincerely several questions referring to intimate aspects of their life. The greatest part were represented by colostomized patients after APR for cancer. To a great extent they came from families but there also were subjects in a specific situation (widowed, divorced, etc).

At the level of the whole group more than 75% considered sexual life before surgery satisfactory. This is mainly the case of males.

A decrease of sexual activity is registered after surgery especially with women. The feeling of dissatisfaction regarding this decrease is nevertheless more important with men despite the fact that erection problem occurred only with 37% of them.

A retrospective look at the date above allows us to realize that the state of being ostomate subsequent to radical surgery of rectal cancer did not harm the sexual comfort to the extend we presumed.

The explanations are multiple and they all lead in a positive direction.

The surgical act even if performed according to some classical standards and often for advanced cancer lesions, did not determine in our group the devastating effects one could have expected.

The relation of social reinsertion, expression of a spirit of understanding and communion among people, seems to have also turned out much better than one would have expected a while ago.

Conclusions

The present study has brought to light in the field of scientific analysis, one of the most delicate consequences of major surgery of the rectum, namely sexual dysfunction.

It shows that, through an effort of understanding and coming together, one can create a state of communication out of which can emerge conclusions that permit amelioration of the life quality of the ostomates as a result of radical surgical procedure for rectal cancer.

The use of valid instruments such as verified life quality questionnaires seems to us the best method of study.

A correlation between the results in the life quality area, including sexual life and the surgical techniques that were used, represents a key to selecting the best tactical and technical options. The morphological and physiological foundations that we know of must be maximal, exploited to this end.

Comparative analyses of the results of open and laparoscopic surgery will definitely have to be taken into account along all these studies.

Multiplying these kinds of studies and broadening the range of the parameters under analysis undoubtedly represent solutions for progress in the field.

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