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Physiotherapy in a patient with colorectal cancer - preoperative management

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Summary

During the surgical treatment of colorectal cancer, whether by laparoscopic or classic open method, the tissues in the abdominal cavity are traumatized. The cuts of the muscle fibers are associated with the disturbance of the tone of the postural muscles. A scar within the abdominal cavity also causes movement limitations in the form of restrictions in the mobility of the spine. The implementation of patient rehabilitation in the form of targeted

physiotherapy before the procedure should be an indispensable element of the treatment of colorectal cancer.
The aim of the study is to propose a therapy that uses the spine mobility test to diagnose deficits. The proposed preoperative therapy focuses mainly on improving the parameters of the spine's mobility. The paper presents examples of activities that can be used in therapy before surgery. A review of the available literature and own experience were used for the work.

It can be concluded from the analyzed literature that physiotherapy in oncological patients is not very widespread and is neglected in the treatment process. Patients, by In the literature, before colorectal cancer removal surgery, they are not subjected to physical rehabilitation, which is associated with complications resulting from the course of the procedure.

The process of rehabilitating patients after surgical treatment of colorectal cancer should take place in the pre-operative period. Physiotherapy should take into account the weakening of the muscle strength in the trunk and limitations of mobility caused by age. Rehabilitation should be aimed at restoring functionality.

Key words: cancer, rehabilitation, spine mobility ranges

Introduction

Colorectal neoplasms classified in the ICD-10 under the codes C18-21 are responsible for 8% of deaths worldwide due to cancer. It is the fourth most common cancer cause of death, causing approximately 600,000 deaths. The mortality rate is lower in women than in men [1].

Physiotherapy and broadly understood rehabilitation in cancer patients is still an overlooked issue. There is a lack of medical personnel in oncology departments to improve the patient.

In Poland, 18,000 Poles develop this cancer each year, of which as many as 12,000 die. The dynamics of the incidence of this disease is one of the highest in Europe. the latest data show that in 2025 this cancer will affect approximately 15,000 men and 9,100 women - a total of over 24,100 people [2]

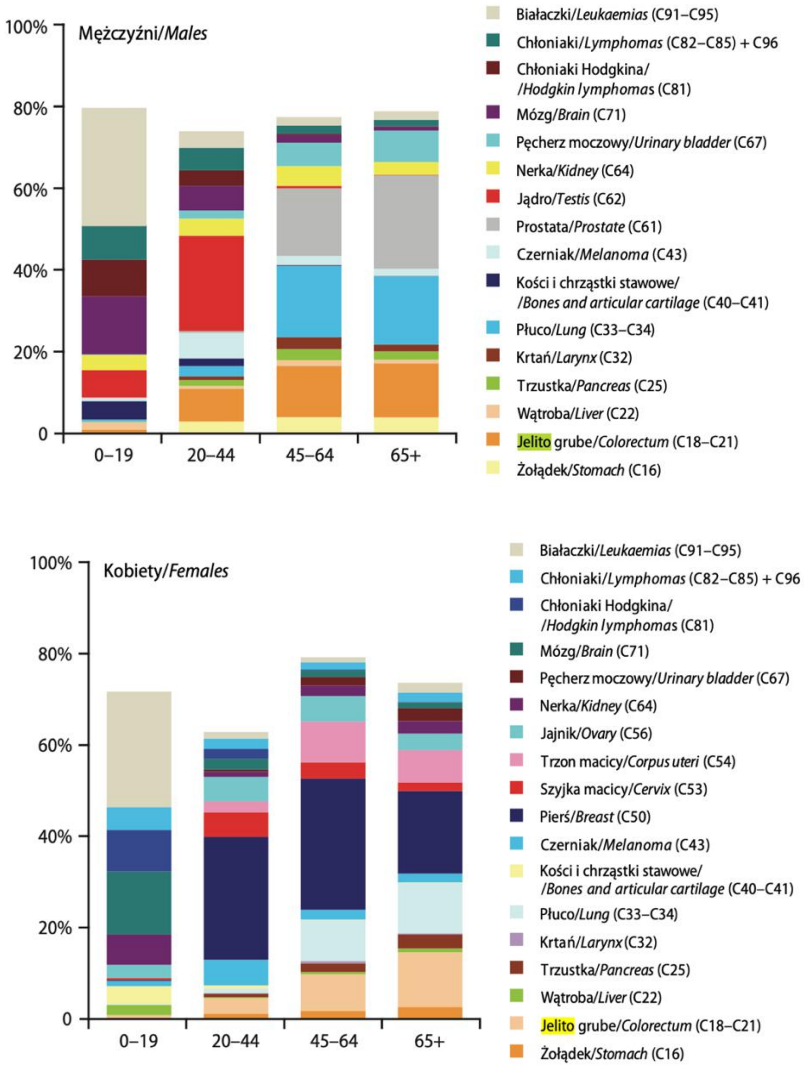


Chart 1. Structure of cancer incidence in Poland among men and women in Poland [2]

Due to the situation related to the SARS-CoV-2 coronovirus pandemic, preventive examinations were limited by restrictions, but also by fear of patients. In the case of colorectal cancer, the screening test is colonoscopy. In 2019, the admission rate for the examination in the screening program in Poland was less than 17% [2].

After 2020, it is estimated that this percentage was even lower, which may result in the detection of late-stage neoplasms and thus reduced survival.

After the age of 50, the incidence of gastrointestinal cancer increases very quickly with each decade [2].

At the same time, in the most endangered age groups, diseases of the theft and respiratory system as well as other organs important for life constitute a serious burden, which significantly reduces the efficiency of the system [2].

It is estimated that as many as 80% of people over 65 are affected by at least one cardiovascular or respiratory system disease [1}. This clearly proves the scale of threats to which patients with malignant neoplasms are exposed. This is not the only problem in this group of patients. Physical and mental performance decreases with age, therefore treatment of the underlying disease may be limited by the presence of comorbidities, or comorbidities will result in failure of the treatment of the underlying disease.

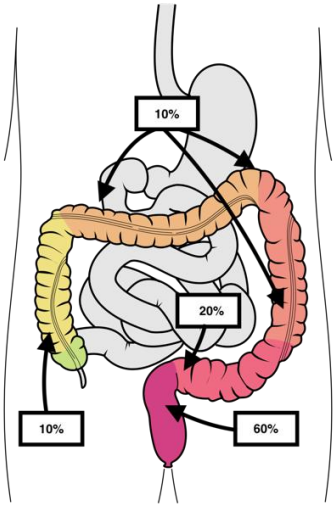


Fig. 1. The occurrence of neoplastic changes in the large intestine. Source: (own elaboration).

Description of the issue

The method of treating colorectal cancer depends on the stage of the disease at the time of diagnosis. From the reports on the methods of application, the most commonly used is the combination of surgery and chemotherapy [3]

Tab. 1. The use of colorectal cancer treatment in Poland [2]

Rodzaj terapii	stadium I	stadium II	stadium III	stadium IV
duże zabiegi chirurgiczne	49%	77,0%	71,1%	30,0%
chemioterapia	0%	38,4%	68,8%	48,2%
radioterapia	0%	7,1%	8,0%	4,9%

Surgery is always the basic method of treating colorectal neoplasms and its performance should be considered in all cases.

Sometimes surgery is possible after the reduction of neoplastic changes or their reduction, after the completion of neoadjuvant treatment.

Due to the determination of the treatment plan, it is possible to improve the patient in the pre-operative phase, as well as in the case of previously implemented initial-complementary treatment.

In colorectal cancer resection it is necessary to excise the tumor together with a fragment of the large intestine. This procedure is performed under general anesthesia. It is usually performed by cutting on the skin of the abdomen, 15–30 cm long [4].

In recent years, laparoscopic surgery has developed. The decision to perform such a procedure depends on the size and location of the tumor, comorbidities and the patient's preferences [5]. In the case of laparoscopy, the incision is limited to 10 cm, and the trocar incisions from the laparoscope.

In the literature, older age is not a contraindication to laparoscopic colorectal surgery, and it should even be considered an indication for the use of this technique [5].

The publications assessing the possibility of laparoscopy in cases that until recently were considered reserved for open surgery due to the severe general condition of the patient may be considered very important. It was shown that the number of complications, mortality, and the need for repeated hospitalizations were similar, but the stay in the hospital after laparoscopy was significantly shorter [4, 6].

The best quality of life for patients should be ensured at every stage of treatment. The improvement process should run parallel to the treatment of the underlying disease.

Due to the surgery, we can distinguish as undesirable effects:

- change of posture - caused by a scar within the abdominal wall which affects the mobility of the spine,
- restriction of mobility in the joints of the girdles of the upper and lower limbs,
- reduction of muscle strength mainly in core muscles.

Physiotherapeutic treatments should be adjusted to comprehensively address all the consequences of immobilization and structural changes.

Due to the surgical scar, exercises that directly involve the structure of the torso are not recommended. Using the PNF (proprioceptive neuromuscular facilitation) method, the structures located in the operated area are indirectly affected.

The available literature focuses on improving the patient after the surgery. There are no reports of rehabilitation before the scheduled surgery.

Proposed procedure

In the course of therapy, its goal should be established first. For this purpose, the ICF classification [9] should be used.

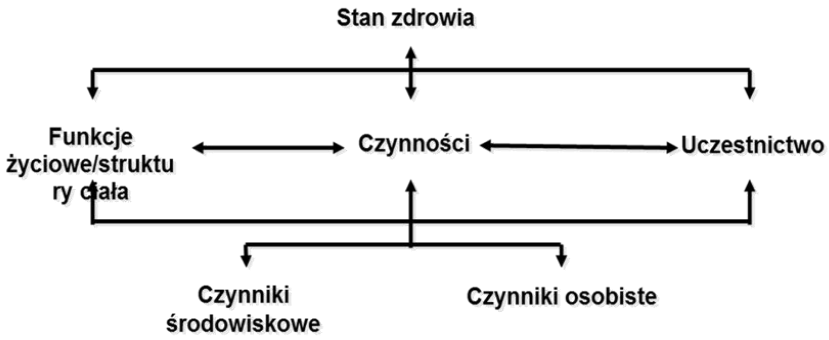


Fig. 2. ICF procedure and classification scheme

Source: (own elaboration)

Before starting therapy, an interview with the patient should be made, therapeutic goals should be set, and the patient's medical history should be examined through standardized tests.

Spinal mobility tests can be used to assess the patient's level of fitness.

Spinal mobility measurements are standardized and can be reliably assessed.

Spine mobility test [10]

Spine mobility is assumed to change with age. For this reason, 3 groups have been distinguished:

I - people from 18 to 40 years of age

II - people from 41 to 60 years of age

III - people from 60 to 85 years of age

The examination may include both the selected section of the spine and the structure as a whole.

The whole spine

By measuring the total range of motion of the entire spine, from the outer occipital tuberosity to the medial crest of the sacrum right next to its posture. The measurement is made twice, in

the neutral, upright position and with the maximum forward bend, with the knees extended. The standards are as follows:

I: 11,5 cm

II: 10 cm

III: 7,5 cm

Thoracic (Otto Test)

The thoracic spine comprises the Th1-Th12 vertebrae. The measurement is made in a relaxed standing position and includes flexion. The distance is measured from Th1-Th12 in the neutral position and then in the maximum forward inclination (Fig. 2). After re-measurement in this position, the difference should be:

I: 2.5 cm

II: 2 cm

III: 1.5 cm

Lumbar region (Schober test)

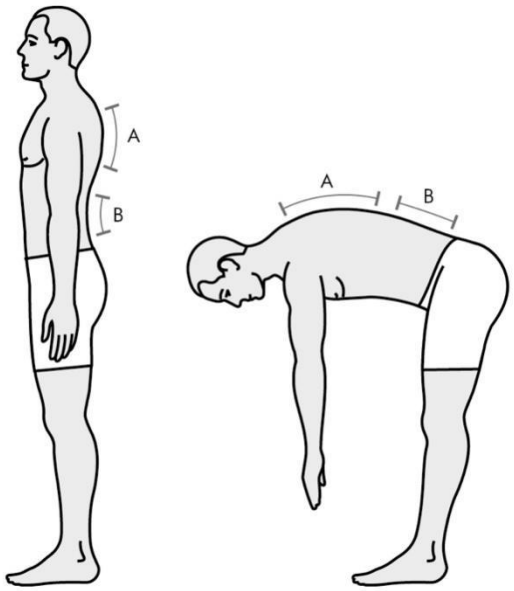
Covers vertebrae from L1 to L5.

Flexion is measured by the distance from L1-L5 in the neutral position and with the maximum forward bend with the knees extended (Fig. 2). Standards include:

I: 6 cm

II: 5 cm

III: 4 cm



Dig. 2. Measurements of the spine's mobility - flexion of the thoracic and lumbar sections [5]

Extension is measured by the distance from the end of the xiphoid process to the area of the pubic tubercles of the pubic bone. The patient performs maximum extension (backward bend). The difference after re-measurement should be:
I: 8 cm
II: 6.5 cm
III: 4.5 cm

Thoracic-lumbar section
The movements involving the thoracic and lumbar sections at the same time are: the lateral slope and the torso twist.
The lateral inclination is measured by the distance from the top of the armpit to the highest point of the iliac plate on the same side. The patient then bends to the side (movement in the frontal plane). Correct Difference:
I: 9 cm
II: 7.5 cm
III: 5 cm

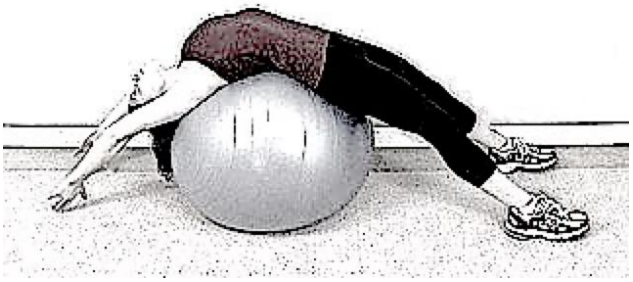
Torsion refers to the difference in the distance between the lower end of the xiphoid process of the sternum and the anterior superior iliac spine. The move performed prior to the second measurement is the maximum turn away from the selected anterior superior iliac spine. The standards are:
I: 4.5 cm
II: 3 cm
III: 2 cm
It should be remembered that each spine mobility test is performed on both sides.

After conducting diagnostic tests, therapeutic goals can be determined. Tissue traumatization that occurs during surgery in the abdominal cavity, both during classic and laparoscopic surgery, has a negative impact on the range of spine mobility. Therefore, if in one of the ranges the patient does not reach the standards for his age, rehabilitation measures should be implemented to counteract greater dysfunction after surgery.

For this purpose, general exercises aimed at restoring flexibility and range of mobility of the spine are performed.

Proposed procedure

In the proposed pre-operative rehabilitation procedure, exercises with the use of rehabilitation balls are used to enable weight-bearing exercises (Fig. 4).



Dig. 4. Using the ball to perform the maximum extension while relieving (own study)

In order to work on improving the mobility of the spine in the direction of flexion, it is necessary to work primarily with the ischio-shin group of muscles. For this purpose, you can use the strap on the foot (Fig. 5).

Fig. 5. Exemplary stretching of the ischio-shin group (own elaboration)

When working on rotation, you can use the lying position as a position that is safe for the patient (Fig. 6.)

Fig. 6. The patient rotates the spine by moving his hand (own elaboration)

Exercises that have a positive effect on the lateral flexion of the spine, for the safety of the patient, can be performed in sitting positions (Fig. 7).

Fig.7. Proposed exercise - bend to the side in a sitting position (own elaboration)

The proposed procedure aimed at restoring the normal ranges of spine mobility should be implemented already before the surgery. Surgery is a pre-planned treatment procedure and waiting times should be spent on improving the patient.

The proposed physiotherapeutic procedure should be extended to breathing exercises performed in the phases of stretching in accordance with the mechanics of the chest.

Conclusion

1. Patients diagnosed with colorectal cancer should undergo physical therapy before the planned surgery

2. Physiotherapy should be preceded by diagnostic tests to determine a measurable goal of physiotherapy

3. Spine mobility disorders occur after surgery due to tissue traumatization

4. Exercises for the mobility of the spine should be performed in accordance with the respiratory rhythm

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