ISSN 1392–0995, ISSN 1648–9942 (online)
LIETUVOS CHIRURGIJA
*Lithuanian Surgery*
2004, 2(3), p. 208–214

# Surgery of rectal cancer at University Hospital of Ostrava, Czech Republic

## Tiesiosios žarnos vėžio chirurginis gydymas Ostravos universiteto ligoninėje, Čekijos Respublika

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**Background / objective**

Czech Republic is among the countries with the highest incidence of rectal cancer. The aim of the prospective study was to monitor the surgical treatment of patients with the diagnosis of rectal cancer.

**Patients and methods**

188 patients (121 males and 67 females) with rectal cancer were operated on within the period of three years (2000–2002). The definitive analysis encompassed 171 patients. The following aspects were observed: the types of operations carried out, the safety distance of the lower resection line during the operation of rectal cancer mainly, the amount of lymphatic nodes spotted in the mesorectum and the possibility of their laparoscopic treatment.

**Results**

129 patients were operated on by conventional methods and 42 patients (24.6%) by laparoscopical methods (25 anterior resections, 6 abdominoperineal amputations, 10 colostomies, 1 proctocolectomy). At a distance of 2 mm from the aboral edge of the tumour, the distal intramural spread of cancer was detected in 8 (11.8%), at 5 mm in 6 (9%), at 1 cm in 2 (2.6%), at 2 cm in 4 patients (5.8 %) and at 5 cm from the macroscopical edge no distal intramural spread was recorded. Enlarged lymphatic nodes were discovered in 128 patients. In total, there were 1383 lymphatic nodes, i.e. 10.8 lymphatic nodes per patient. 271 lymphatic nodes (19.5%) affected by a tumour process, i.e. 2.1 affected lymphatic nodes per patient were found. The number of the affected lymphatic nodes in the mesorectum was compared in connection with the usage of conventional or laparascopical operation. There was no difference in oncological radicality as far as these types of operations are concerned.

**Conclusions**

There is no evidence of the spread of well differentiated adenocarcinoma from the aboral edge of the tumour. All positive findings of distal intramural spread were found in the medium and lower differentiated adenocarcinomas. The distal intramural spread of the tumour is quite rare, but when present it signifies a very advanced and aggressive progress of the illness with a bad prognosis. It is too early to formulate the conclusions comparing the conventional and the laparoscopic approaches to rectal cancer.

## Introduction

Colorectal cancer has become not only a medical but also a social problem due to the constantly increasing incidence. Czech Republic belongs to the countries with the highest incidence of rectal cancer. In our study, a brief survey of facts acquired from literature is presented, which has also provided us with more experience as for the diagnosis and treatment of patients with rectal cancer.

The aim of the prospective study was to monitor the surgical treatment of patients with the diagnosis of rectal cancer. As will be mentioned in Results, certain aspects were observed: types of operations carried out, the safety distance of the lower resection line mainly during the operation of rectal cancer, the amount of lymphatic nodes spotted in the mesorectum and the possibility of their laparoscopic utilization. We believe that the results of our study will assist in improving the medical care of patients and will, at least modestly, contribute to the improvement of the treatment of rectal cancer.

## Patients and methods

In our study we focused on patients with rectal cancer who were operated on within the period of three years (2000–2002) at the Department of Surgery at University Hospital of Ostrava. During this time there were 188 patients with rectal cancer treated in our ward. The definitive analysis included 171 patients.We also closely cooperated with the Institute of Pathological Anatomy of University Hospital of Ostrava, where the removed parts of rectum were carefully investigated according to the conventional specified protocol.

## Results

There were 188 patients with rectal cancer treated at the Clinic of Surgery of University Hospital of Ostrava from the year 2000 to 2002. The patients comparised 121 males (64.4%) and 67 females, i.e. the ratio of men and women was approximately 2:1.

The age of the women and men was almost the same, the average age being 65 (24–97), with no practical difference between the men (64.9, range 27–97) and the women (65.2, range 24–83).

The tumour was localized in the lower third of the rectum in 89 cases (47.3%), in the middle third in 46 cases (24.5%) and in the upper third of the rectum in 53 cases (28.2%). The average size of tumour measured on the samples was 5.0 × 4.8 cm (1–15 cm × 1–15 cm). The average size of tumour was recorded to be 5.4 × 4.8 cm (1–15 cm × 1–15 cm) in men and 5.0 × 4.4 cm (2–10 cm × 1–10 cm) in women.

194 operations were done, of them 19 (9.8%) were acute and 175 (90.2%) planned. There were 83 (42.8%) anterior resections of the rectum, 51 (26.3%) abdominoperineal amputations, 29 (14.9%) colostomies, 5 (2.6%) Hartmann's operations, 6 (3.1%) transanal excisions according to Parks and 9 (4.6%) TEMs (transanal endoscopic microsurgery). Besides, the following procedures were performed: total colectomy with ileal J-pouch (0.5%) in one patient, laparoscopic proctocolectomy 1 (0.5%) [1, 2] and tentamen-resection of the rectum 1 (0.5%) with haemorrhage from the praesacral plexus. In eight (4.1%) patients, a self-expandible stent was installed.

From the whole number of 171 operations in which conventional or laparoscopic methods of operation were considered (resections, abdominoperineal amputations, colostomies, Hartmann's operations), 129 patients were operated on by conventional methods (58 rectal resections, 45 abdominoperineal amputations, 19 colostomies, 1 colectomy, 3 Hartmann's operations, 1 haemostasis due to praesacral haemorrhage), and 42 patients (24.6%) were operated on by laparoscopical methods (25 anterior resections of rectum, 6 abdominoperineal amputations, 10 colostomies, 1 proctocolectomy).

During the examination of the perioperationally dissected part, first of all the distance of the aboral edge of tumour from the *linea dentata* was measured. The distance was 6.9 cm (0–17) on average, but in one of the women it was bigger and so added up to 7.9 cm (0–17). In the group, the average distance of the lower resection line from the aboral edge of the tumour was 3.7 cm (0–8). In cases of resections, anastomosis was constructed in 84 patients, of them 19 (22.6%) were sutured by hand. The stapler technique was used in 65 of cases (77.4%).

The patients spent on average 4.8 days (0–40) in the intensive care ward. In total, the average hospital stay was 14.2 days (1–61).

At a distance of 2 mm from the aboral edge of the tumour, the distal intramural spread of cancer was detected in 11.8% of cases, at 5 mm in 9% of cases, at 1 cm in 2.6% of cases, at 2 cm in 5.8%, and at 5 cm from macroscopical edge the distal intramural spread was recorded in 0% of cases. There was no evidence of tumour spread at a distance of 5 cm from aboral edge of the tumour (Table 1).

**Table 1.** Results of the measurement of the distal intramural spread of tumours from their aboral edge

| Distance under the edge of the tumour | Number of patients | Negative findings | | Positive findings | |
|---|---|---|---|---|---|
| 2 mm | 68 | 60 | 88.2% | 8 | 11.8% |
| 5 mm | 67 | 61 | 91.0% | 6 | 9.0% |
| 1 cm | 77 | 75 | 97.4% | 2 | 2.6% |
| 2 cm | 69 | 65 | 94.2% | 4 | 5.8% |
| 5 cm | 47 | 47 | 100% | 0 | 0% |

The grading of the tumour was another parameter studied. In our study, we found altogether 61 patients with grading G 1 (32.4%), from this number 2 with mucous production (3.3%), 74 patients with grading G 2 (39.4%), of them 6 with mucous production (8.1%), and 31 patients with grading G 3 (16.5%), of them 5 with mucous production (16.1%). No grading was determined in 22 of cases (11.7%). In connection with the examination of grading we investigated dissimilarities and similarities in grading before operation and the actual situation after operation. We found that the postoperative grading was the same as definitive in 73% of cases, different conclusions were found in 27% of cases.

In our study, enlarged lymphatic nodes were discovered in 128 patients. (There are two different Departments of Pathology at the University Hospital in Ostrava. Specimens were investigated according to protocol only in one of them. Specimens investigated in the second one were excluded from our study). In total, there were 1383 lymphatic nodes, i.e. 10.8 lymphatic nodes per patient. 271 lymphatic nodes (19.5%) were affected by a tumour process (2.1 affected lymphatic nodes per patient).

After that, the number of the lymphatic nodes affected in the mesorectum was compared in connection with the usage of conventional or laparoscopical operation. There was no difference as far as these types of operations are concerned in oncological radicality. In our study the following was recorded: conventional operations – 111 patients in total, 1196 lymphatic nodes, i.e. 10.7 lymphatic nodes per patient were found. Of them, 19.7% were positive cases, giving the number of 2.1 positive lymphatic nodes per patient. In examination of lymphatic nodes after laparoscopical operations comparable results were achieved: the number of patients – 17, lymphatic nodes in total – 187. Therefore there were 11.0 lymphatic nodes per patient, the positivity coming to 18.7%, and there were 2.0 affected lymphatic nodes per patient.

Also, this comparison of the conventional and laparoscopic methods of operation regarding the finding of lymphatic nodes was evaluated statistically. Table 2 is used to test the hypothesis that the probability of finding lymphatic nodes and their positivity do not depend on the type of operation. From the statistical point of view, it is clear that it is not possible to rule out the initial hypothesis and thus the positivity of findings lymphatic nodes does not depend on the type of operation (laparoscopical or conventional).

Finally, the recurrence of rectal cancer was found in 36 cases (23.0%), of them 16 were in patients with tumour in the lower third of the rectum, 10 in patients with the tumour in the middle part, and 10 recurrences were in patients with the tumour in the upper third of the rectum. Local recurrences in the anastomosis were found in 4 cases (4.8%). 57 patients (30.3%) died by now.

**Table 2.** Involvement of lymphatic nodes

| | Positive lymph nodes | Negative lymph nodes | Total |
|---|---|---|---|
| Conventional operations | 236 | 960 | 1196 |
| Laparoscopical operations | 35 | 152 | 187 |
| Total | 271 | 1112 | 1383 |

The value of the statistic chi-square is 0.1059. It corresponds to the probability of $p = 0.7448$. As $p > 0.05$, it is not possible to rule out the mentioned hypothesis at a level of 0.05.

## Discussion

Handley [3] in the year 1910 and Cole [4] in 1913 came up with an idea that when removing a tumour during resection of the intestine, it is necessary to remove even its part under the tumour. Later Grinnell [5] found DIS in 12% of his patients, and he became a supporter of the rule of 5 cm. The safe distance of the lower resection line is minimally 5 cm from the aboral edge of the tumour [5].

Williams [6] published his important work in 1983. He assessed the rule of 5 cm brought into practice and recommended the possibility of reducing this distance of the lower resection line from the edge of tumour to 2 cm in some special cases.

Gamagami [7] compared the results of treatment of the rectal cancer patients who had undergone lower resection of rectum or abdominoperineal amputation. He also focused on the interval of survival and on the occurrence of local tumour relapse. In conclusion, he emphasizes that keeping to all oncological rules does not mean that the usage of sphincter-saving operations will reduce the five-year interval of survival or will increase the number of local relapses.

Another comparison study of patients according to the distance of resection line was done by Karanjia [8]. He found that there were no significant differences between the groups of patients with resection distance less than 1 cm and with the resection distance of the line larger than 1cm. Karanjia claims that the reduction of the resection line distance does not increase the number of local relapses.

Comparisons similar to [7] were found by Ferulano [9] in 2000. He compared local relapses after the abdominoperineal amputation of the rectum and after its anterior resection. He indicated that the anterior resection of the rectum was a method suitable for oncological standards, because local relapses and the interval of survival do not change compared to the abdominoperineal amputation of the rectum.

We would like to discuss briefly the laparoscopical method of operation of rectal cancer. Even though the numbers of operations accomplished so far are not adequate for drawing definitive conclusions, we believe that the above-mentioned data are sufficient as preliminary results, as our hospital is the pioneer workplace in Czech Republic where laparoscopical operations are performed [10–12].

As in the literature [13–15,16] the main problem of the laparoscopic methods can be the adequate extent of lymphatic node dissection, as well as construction of safe anastomoses and removing the dissected specimen from the abdominal cavity.

We must also agree with Kim's [17] opinion that the problem for laparoscopic surgery is also tumour localization. Colonoscopic examinations have been frequently shown as not precise. We consider colonoscopical examination to be adequate if the tumour is localized in the rectum or close to the Bauhin's chamber. In other cases we advise pre-operative colonoscopy with colouring the place of the tumour or irrigografic examination.

Comparing conventional and laparoscopic operations of rectal cancer as far as the findings of lymphatic nodes are concerned, the objections of some surgeons against the laparoscopical method regarding radicality can be answered. We have found that

there is no difference between the laparoscopical and the conventional methods of operation in the oncological radicality. By the conventional method of operation, medical findings of 10.7 lymphatic nodes per patient in the mesorectum were recorded in our study. From this number, 10.7% were positive cases. There is an evidence of comparable results in the examination of lymphatic nodes after the laparoscopical method of operation. There were 11.0 lymphatic nodes per patient and the positivity of nodes equalled 18.7%.

These results of conventional and laparoscopic operations are fully comparable, which was also confirmed by statistical tests.

We conclude that in our study there is no evidence of the spread of a well differentiated adenocarcinoma, not even at a distance of 2 mm from the aboral edge of the tumour. All positive findings of distal intramural spread were found in the medium and lower differentiated adenocarcinomas. The distal intramural spread of the tumour occurs quite rarely, but when it does it signifies a very advanced and aggressive progress of the illness with a bad prognosis. We have pursued observation of lymphatic nodes in

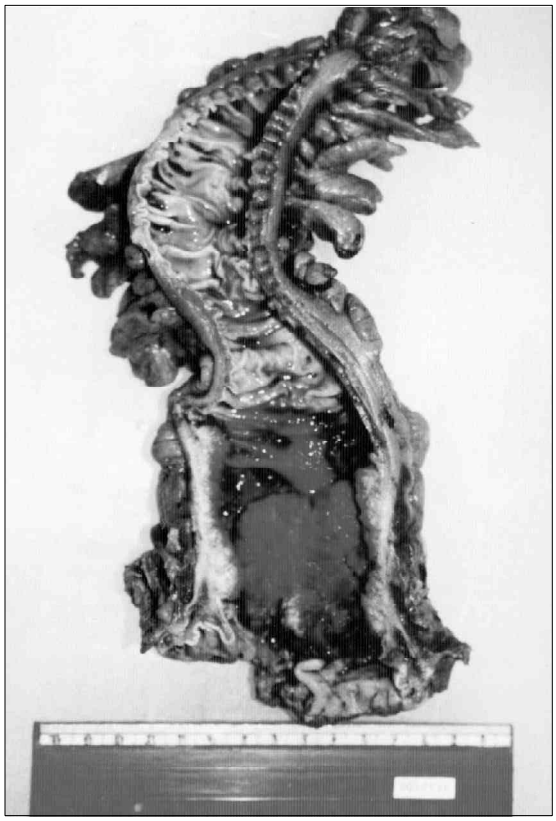

**Fig. 1.** Dissected part of affected rectum with cancer

**Fig. 2.** Laparoscopical proctocolectomy

**Fig. 3.** Dissected part of rectum with carcinoma and lymphatic nodes in mesorectum

the mesorectum within the study. In total, there were 1383 lymphatic nodes. With reference to this figure, a metastatical tumour process was found in 271 nodes, which make 19.5 %. There were 10.8 lymphatic nodes per patient on average.

It is too early to draw any conclusions comparing the conventional and the laparoscopic approaches to rectal cancer. Nevertheless, the initial results regarding the comparison of these two methods of rectal cancer operations are possible. We can see that the objections against laparoscopic operations regarding their radicality are not substantiated and that the results obtained by the two methods when removing lymphatic nodes in the mesorectum are comparable. This result should be confirmed in prospective randomized trials on a large group of patients.

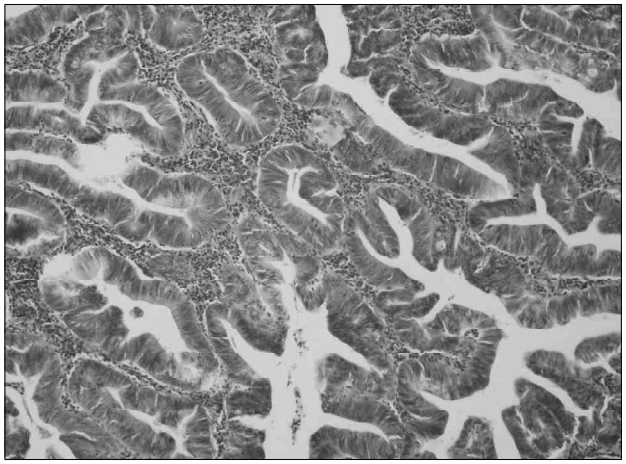

**Fig. 4.** Tubular structures of well differentiated adenocarcinoma, histology colouring with hematoxylin-eozin (×100)

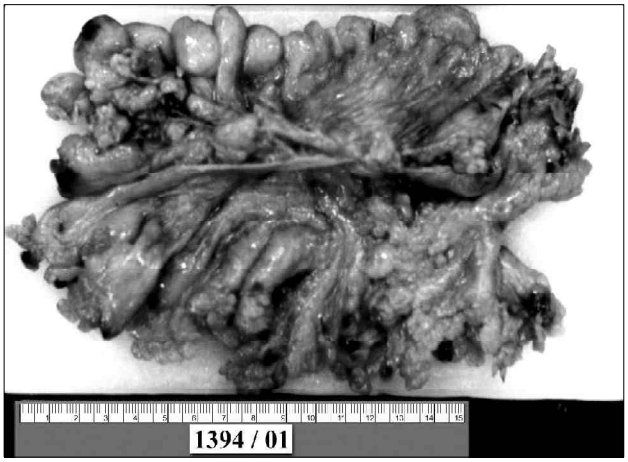


**Fig. 5.** Extra colic fat tissue prepared on paraffin board

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*Gauta: 2004-04-05*
*Priimta spaudai: 2004-09-03*

## Invited comments

The article by P. Vavra et al "Surgery of Rectal cancer at University Hospital of Ostrava (Czech Republic)" presents a large single centre series of treated rectal cancer patients. About 60 patients are treated in their departament per year. Laparoscopic technique is being employed in a significant proportion (almost 25%) of cases. Distant results of treatment – local recurrence rate of 4.8% – seems to be acceptable. However, there are some points which demand clarification.

It has not been commented on the use of radiotherapy for these patients. It has been proved in randomized controlled trials [1] that combination of preoperative radiotherapy with surgery improves overall and cancer-specific survival compared with surgery alone.

Another important point which should be mentioned is the use of technique of total mesorectal excision. It has been proved both in individual series [2] and nation-based trials [3] that standardized TME technique results in decreased local recurrence and improved survival in these patients. Using of TME technique would also stop the discussion around the numbers of lymph nodes in open and laparoscopic TME – they should be identical, because the operation should be done according to the same standards, and access would be the only difference.

Some important facts were also omitted from the discussion – the use of protective ileostomy was not discussed, the rate of anastomotic dehiscence, postoperative morbidity and mortality were not pointed out. They should be mentioned, considering the aim of the article.

The authors should be congratulated for implementing laparoscopic surgery for their rectal cancer patients, which is a demanding and time-consuming task. Some more information about this part of their experience would be very interesting.

In conclusion, this article would be interesting for peers working in the field of rectal cancer treatment, especially if the points mentioned above were added.

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