

Assessment of quality of life in patients with non-operated pancreatic cancer after videothoroscopic splanchnicectomy

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Abstract

Introduction: Pancreatic tumours are a crucial medical issue. The majority of patients report sick in the late stage of carcinoma clinical advancement, which considerably limits the possibility of surgical treatment. Pancreatic cancer patients with no other alternative but palliative treatment constitute a large group.

Aim: To assess pain intensity levels and quality of life of pancreatic cancer patients after videothoroscopic splanchnicectomy.

Material and methods: Between 2001 January and 2010 November in the Department of Thorax, General Surgery and Oncology of the Medical University of Lodz 262 patients with pancreatic tumours were hospitalized. In 121 cases grade 3 and grade 4 tumours were observed. Hundred and twenty-one videothoroscopic procedures of sympathetic trunk and ganglion excision were performed in 89 patients.

Results: Before the procedure the pain intensity level according to VAS was 5.66 (3.9-7.2; SD 1.24) in the trial group and 5.46 (4.1-7.1; SD 1.15) in the control group. The quality of life average assessment in both groups did not differ statistically ($p = 1.07$) and was 46.3 (32-66; SD 0.92) in patients before the operation and in the control group 50.3 (41-63; SD 0.75). On the 7th postoperative day the pain intensity on average was 2.33 (1.2-3.9; SD 0.78) and 4.57 (3.6-5.5; SD 0.69) respectively. One week after the procedure the quality of patients' life was estimated at 64.1 (39-83; SD 1.38) and in the control group at 52.2 (42-65; SD 0.71); the differences are significant ($p < 0.05$). Thirty days after the procedure 12 patients did not take any painkillers (13.5%), and in the others a considerable decrease of the taken drugs was observed. On average, the pain intensity was estimated at 1.78 (0.6-3.6; SD 0.68). The quality of life, on the other hand, improved considerably in relation to the state prior to the procedure, but increased insignificantly in relation to the state on the 7th postoperative day to 70.9 (52-88; SD 1.14).

Conclusions: Splanchnicectomy is a safe method of cancer pain treatment in patients with advanced pancreatic tumours. Videothoroscopic excision of visceral nerve thoracic section contributes to the statistically significant decrease of cancer pain intensity and considerably improves the quality of patients' lives.

Key words: pancreatic cancer, palliative treatment, videothoroscopic splanchnicectomy.

Introduction

Pancreatic tumours are a crucial medical and socio-economic issue. Their diagnostics and treatment constitute a huge problem. There is no single, efficient method of achieving diagnosis and differen-

tiation of pancreatic tumours which would offer an opportunity for effective non-invasive or surgical treatment. Nowadays, in the 21st century, despite the diversity of imaging modalities, a surgeon beginning an operation is never certain if a tumour they are going to operate on is malignant or benign. It is often

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found out intraoperatively that a tumour is non-resectable, which means it is too advanced for a radical procedure. The number of such procedures – exploratory laparotomies – according to different studies, amounts to 20% of patients operated on due to pancreatic tumours [1]. Considerable advancement of a tumour and a lack of possibility of establishing a biliary-intestinal anastomosis do not conclude the possibility of further, palliative treatment. Symptoms of pancreatic cancer are scant and produced late. They typically include painless jaundice (up to 82%), stomach ache (up to 32%), weight loss and anorexia (up to 29%), therapy-resistant pruritus (up to 21%), vomiting and/or diarrhoea together with progressive malnutrition often indirectly leading to death [2]. However, cancer pain is the most severe and difficult to relieve presentation of a tumour. Videothoroscopic splanchnicectomy is advisable in patients with tumours which cannot be radically operated on in order to limit cancer pain [3-5]. In 1943 the first excision of visceral nerves was performed using a laparotomic approach, and in 1990 via a thoracotomy approach [6, 7].

Splanchnicectomy consists in excision of the major thoracic visceral nerve made of branches which extend from the 5th to the 10th thoracic sympathetic ganglion. Visceral nerves consist of fibres narrowing the digestive tube, repressing peristaltic motion and increasing the tension of the sphincters. Moreover, they transmit pain stimuli from abdominal viscera [8].

Aim

To assess pain intensity levels and quality of life of pancreatic cancer patients after palliative videothoroscopic splanchnicectomy.

Material and methods

From 2001 January to 2010 November (a 10-year observation period) in total 262 patients with pancreatic tumours were hospitalized in the Department of Thorax, General Surgery and Oncology of the Medical University of Lodz. Apart from interviews and physical examinations, in all patients the following additional diagnostic modalities were used: abdominal ultrasound and/or computed tomography, and/or endoscopic retrograde cholangiopancreatography, and/or magnetic resonance and/or magnetic resonance cholangiopancreatography.

On their basis grade 3 and 4 pancreatic tumours were diagnosed in 121 patients, in whom non-resectability was determined pre- or intraoperatively. In the preoperative period all patients with chronic cancer pain of epigastrium received orally and/or percutaneously painkillers, including narcotic drugs. hundred and twenty-one videothoroscopic procedures of sympathetic trunk and ganglion removal were performed in 89 patients. The procedure was performed under general anaesthesia with selective intubation one of the main bronchi. The patient was placed in a lateral position, the first visual trocar in the mid-axillary line in the 5th intercostal space, the next two trocars in the 6th and 7th intercostal space in the anterior and posterior axillary line. After the paravertebral incision of the parietal pleura and the preparation of the nerve structures had been performed, the 8-10 cm fragment of innervation was removed. When the splanchnicectomy was over, the lung was ventilated and expanded intraoperatively. Currently drainage is not used. Each time the material was histopathologically examined. In all the patients the pain intensity was assessed before the procedure, on the 7th postoperative day and 30 days after the procedure.

A visual analogue scale (VAS) was used to record subjective estimates of patients' pain intensity [9]. The amount of pain a patient was experiencing was compared to the worst pain imaginable. The first level, "0", meant no pain. Level "1" was a ghost of pain and level "10" meant the maximum pain. SF-36 (Short-Form Health Status Survey) was filled in to assess the quality of life. The protocol consisted of two parts: the first assessed functionality (physical fitness, functioning in society, limitations caused by physical and emotional problems), the second assessed mental fitness, stamina and vitality [10]. The acquired results – the answers were converted according to certain rules so that they could be presented on a 100-point scale, where 0 meant the worst quality of life while 100 meant the best. The compared group ($n = 32$) consisted of patients with non-resectable pancreatic tumours (grade 3 or 4) who were in no shape for thoracovideoscopy due to poor general condition, or co-existing diseases such as chronic obturative pulmonary disease or asthma. The scales and forms were analysed. Seventy-five patients (62%) reported for control visits. The remaining group either did not come or families refused information about the deceased. The statistical analysis was carried out with SPSS (for Windows) by

Student's *t*-test. The data are presented as the average ± standard deviation. Values of *p* < 0.05 were accepted as statistically significant.

Results

In the research material the mean age was comparable in both groups and was 63.2 years old (44 to 86 years old). The series involved 56.6% women and 43.4% men. The differences between the control and trial group were statistically non-significant. Before the procedure pain intensity level according to VAS was 5.66 (3.9-7.2; SD 1.24) in the trial group and 5.46 (4.1-7.1; SD 1.15) in the control group (Table I).

The quality of life average assessment in both groups did not differ statistically (*p* = 1.07) and was 46.3 (32-66; SD 0.92) in patients before the operation and in the control group 50.3 (41-63; SD 0.75).

On the 7th postoperative day the average pain intensity was 2.33 (1.2-3.9; SD 0.78) and 4.57 (3.6-5.5; SD 0.69) respectively. One week after the procedure

the quality of patients' life was estimated at 64.1 (39-83; SD 1.38), in the control group (after intravenous treatment) at 52.2 (42-65; SD 0.71). The differences are significant (*p* < 0.05) (Table II). Thirty days after the procedure 12 patients did not take any painkillers (13.5%), and in the others a considerable decrease of the taken medicaments was observed. On average, the pain intensity was estimated at 1.78 (0.6-3.6; SD 0.68), which differed considerably from the estimated pain intensity before and one week after the procedure (Table III). The quality of life, on the other hand, improved considerably in relation to the state prior to the procedure, but increased insignificantly in relation to the state on the 7th postoperative day to 70.9 (52-88; SD 1.14). The differences in the quality of life with analgesic treatment are shown in Figure 1. The mean time of the procedure was 32 ± 18 min. In 2 patients (1.8%) perioperative complications in the form of pneumothorax were observed. Suction drainage was used. No other early postoperative (up to 30 days following the procedure)

Table I. Pain intensity according to VAS before the procedure and 7 and 30 days after the procedure in the trial group and on the 1st, 7th and 30th day of pharmacological treatment of the control group

VAS	Trial group (n = 89)	Control group (n = 32)	Values of <i>p</i> , <i>t</i>
Before surgery/1 day	5.66 (3.9-7.2; SD 1.24)	5.46 (4.1-7.1; SD 1.15)	<i>t</i> = 0.37, ns
After 7 days	2.33 (1.2-3.9; SD 0.78)	4.57 (3.6-5.5; SD 0.69)	<i>t</i> = 6.94, <i>p</i> < 0.0001
After 30 days	1.78 (0.6-3.6; SD 0.68)	5.96 (4.4-7.8; SD 1.65)	<i>t</i> = 14.37, <i>p</i> < 0.001

Table II. Quality of life based on SF-36 questionnaire before the procedure and 7 and 30 days after the procedure in the trial group and on the 1st, 7th and 30th day of pharmacological treatment of the control group

SF-36	Trial group (n = 89)	Control group (n = 32)	Values of <i>p</i> , <i>t</i>
Before surgery/1 day	46.3 (32-66; SD 0.92)	50.3 (41-63; SD 0.75)	<i>t</i> = 1.07, ns
After 7 days	64.1 (39-83; SD 1.38)	52.2 (42-65; SD 0.71)	<i>t</i> = 2.47, <i>p</i> < 0.05
After 30 days	70.9 (52-88; SD 1.14)	46.3 (37-58; SD 0.88)	<i>t</i> = 7.85, <i>p</i> < 0.001

Table III. Statistical significance of cancer pain intensity differences in patients before the procedure and 7 and 30 days after the procedure in the trial group and on the 1st, 7th and 30th day of pharmacological treatment of the control group

VAS	Before surgery	After 7 days	After 30 days
Before surgery/1 day	5.66 (3.9-7.2; SD 1.24)	<i>t</i> = 10.71, <i>p</i> < 0.0001	<i>t</i> = 14.21, <i>p</i> < 0.001
After 7 days	<i>t</i> = 10.71, <i>p</i> < 0.0001	2.33 (1.2-3.9; SD 0.78)	<i>t</i> = 1.51, ns
After 30 days	<i>t</i> = 14.21, <i>p</i> < 0.001	<i>t</i> = 1.51, ns	1.78 (0.6-3.6; SD 0.68)

Table IV. Statistical significance of the quality of life differences in patients before the procedure and 7 and 30 days after the procedure in the trial group and on 1st, 7th and 30th day of pharmacological treatment of the control group

SF-36	Before surgery	After 7 days	After 30 days
Before surgery/1 day	46.3 (32-66; SD 0.92)	$t = 2.66, p < 0.05$	$t = 8.26, p < 0.001$
After 7 days	$t = 2.66, p < 0.05$	64.1 (39-83; SD 1.38)	$t = 1.21, ns$
After 30 days	$t = 8.26, p < 0.001$	$t = 1.21, ns$	70.9 (52-88; SD 1.14)

complications were detected. The mean hospitalization time was 2.2 (1-5; SD 0.82) days in both groups. In all patients operated on, the excision of the nerve tissue was confirmed by histopathological examination.

Discussion

The idea of quality of life (QL) has been known only recently, since the 1970s. The medical, dynamic development of research concerning QL is observed nowadays. The majority of studies concern chronic and incurable diseases such as carcinoma. Until now, it has been very difficult to define quality of life and unequivocally define issues which should be included in the definition. It remains closely related to the broadly understood term of “health”. The World Health Organisation defines it as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” [11]. In 1995 WHO suggested that quality of life should be understood as an “individual’s perception of his/her own position in life in the context of the culture and value systems in which he/she lives, and in relation to his/her goals, expectations, standards and concerns” [12]. The results indicate that the assessment made by a patient often differs from the one made by a doctor [13, 14]. It is connected with the attitude of a doctor towards threats resulting from the patient’s clinical condition, while patients concentrate on their subjective impressions. Only the combination of both assessments allows for an appropriate approach towards a patient.

The assessment of pancreatic carcinoma patients’ quality of life in the very advanced stage of the disease was the goal of our studies. As mentioned before, in the patients with non-resectable tumour or terminal patients pain treatment presented the most crucial therapeutic problem. A number of therapeutic methods are known nowadays. Videotho-

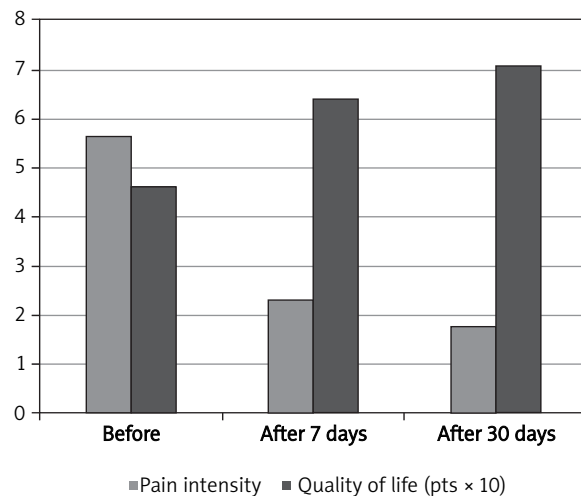


Figure 1. Comparison of changes in the quality of life and cancer pain intensity in patients before the procedure and 7 and 30 days after videothoroscopic splanchnicectomy

roscopic splanchnicectomy appears to be the method of choice as it causes exclusion of nerve impulsion in the autonomic nerve system depending on the removed section. The excision of coeliac plexus nerve fragments permits the exclusion of pain impulses from the epigastrium [15]. It is an excellent and acknowledged way of analgesic treatment. Some authors perform concurrent bilateral splanchnicectomy [16-19]. Others think it should be a two-stage procedure and the choice of the first side depends on the location of the major ailment [20, 21]. There are also cases of the procedure described when the patient is placed face down [19]. In our clinic we do not perform concurrent bilateral splanchnicectomy as we believe every extension of the procedure increases the possibility of complications. The choice of the side operated on was based on the clinical picture. The patients selected for the procedure had obtained unsatisfactory results with pharmacological

treatment at pain or palliative care clinics. According to world reports in patients having undergone effective splanchnicectomy a considerable improvement was observed [22-26].

Our results are similar and indicate improvement of the quality of life and pain intensity decrease, including discontinuation of painkillers in 13% of cases. As early as 7 days after the procedure we observed a considerable decrease of pain intensity and a consequent quality of life improvement. Thirty days after the procedure we observed the next improvement of the quality of life with a concomitant decrease of the pain intensity, but these changes were statistically non-significant. In the literature, there are cases described in which after a few years of observation in patients with similar videothoroscopic procedures such as thoracic or lumbar sympathectomy denervation positive effects and quality of life typically decreased as time went by. The above-mentioned situation can be explained by denervation supersensitivity. It occurs as the result of noradrenalin allergy after postganglionic denervation with excessive increase of sympathetic nervous system tension. Misplaced incision of the sympathetic trunk and the removal of the nerves too lengthy section are the most frequent reasons for such supersensitivity [4, 27-29].

However, in the case of splanchnicectomy performed in carcinoma patients the observation period is relatively short and in the case of grade 3 or 4 tumours does not exceed 2 years [30]. Busher and his team observed that 50% of chronic pancreatitis patients with splanchnicectomy performed experienced pain again within 12 to 60 months [23]. At the same time Vosschulte and his team observing patients (median observation time: 7 years) with chronic pancreatitis found that in 11 out of 13 patients painful sensations did not return [31].

Similarly good results were obtained by authors of works concerning splanchnicectomy in patients with chronic pancreatic cancer [24, 32]. Literature discrepancies connected with analgesic long duration of positive effect probably arise due to different observation periods of carcinoma and pancreatitis patients. On the other hand, they may also result from changeable anatomy of the visceral nerve and possibly from surgical difficulties with complete disconnection of nerve conduction [5, 20]. The thoracotomy approach (1990) presented a considerable risk

for patients with advanced carcinoma disease or oppressive pancreatitis pain and the magnitude of the trauma exceeded the therapeutic effect of post-operative autonomic nervous system excision. Chemical blockades using phenol or alcohol introduced to limit invasiveness did not measure up to expectations due to the lesser efficiency and necessity of repetition [21]. Videothoracoscopy eliminates the above-mentioned inconveniences as a mini-invasive technique allowing for effective and safe excision of visceral nerves and trunks [33, 34]. Of course, this type of procedure is not entirely fault-free. Sometimes bleeding requiring conversion to thoracotomy takes place. After the procedure pneumothorax, pulmonary leakage, Horner's syndrome, emphysema, pleural haemorrhage, or intercostal pain resulting from intercostal nerve contusion at the port site may appear [35, 36].

There were 2 patients (1.8%) with pneumothorax in our series. Short-term, secondary daily drainage of the pleural cavity expands the lung completely and allows further complications to be avoided. Until 2007 we used drainage of the pleural cavity as a standard. Now we perform it only in certain cases. Muscle or intercostal contusion is especially strenuous for patients [24]. In order to avoid them it is possible not to place thoracic ports [37] and either introduce the instruments directly into the pleural cavity through the chest incision or the pleuroscope can be used for the procedure.

Conclusions

1. Videothoroscopic splanchnicectomy is a safe method of cancer pain treatment in patients with advanced pancreatic carcinoma.
2. Videothoroscopic excision of visceral nerve thoracic section contributes to a statistically significant decrease of cancer pain intensity and considerably improves quality of patients' lives.

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