

**The Significance of Laparoscopy in the Diagnosis and  
Management of Chronic Pelvic Pain**

**PhD thesis**

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## **Introduction**

Pain is an unpleasant feeling or emotional sense, that is associated with actual or potential tissue damage. It is always subjective and as a definition cannot be connected to its evoking stimulus.

Generally, there is no accepted definition for chronic pelvic pain. Many authors believe, that the most important criterion for chronic pain is its persistence for more than six months. If we consider only the time scale of pain it does not fully express the essentials of pelvic pain. It seems to be somewhat more accurate to define this disease as follows: chronic pelvic pain is a non-cyclic pain that is persisting for more than six months, it is confined to anatomical structures of the minor pelvis and is severe enough to result in functional disability or to necessitate medical support.

Chronic pelvic pain is more common as it is generally diagnosed. According to a study in United States 15 % of women aged between 18 and 50 years suffer from chronic pelvic pain. Based on a survey among women aged between 18 and 49 years in United Kingdom the prevalence of the disease is similar to that of asthma, dorsal pain, and migraine. With respect to chronic lower-abdominal pain one has to differentiate between symptoms associated with or independent from menstrual cycle. Most common symptoms of pelvipathy associated with menstrual cycle are dysmenorrhoea, mid-cycle pain, premenstrual tension syndrome (PMS), and endometriosis. Lower-abdominal pain independent from the menstrual cycle can be caused by chronic pelvic inflammatory disease, pelvic adhesions, certain ovarian cysts, pelvic vascular congestion, loose support of the uterus (descensus, retroflexion), uterine fibroids, adenomyosis, but pain arising from organs outside pelvis may also radiate to lower abdomen. Radiated pain to lower abdomen is usually caused by gastro-intestinal disease (60%) but may also originate from liver-, gall bladder-, renal-, and ureteral disease.

## Objectives

The purpose of the study was to investigate the etiological factors of chronic pelvic pain and the role of laparoscopy in the diagnosis and management of lower-abdominal pain.

1. What is the proportion of patients with chronic lower-abdominal pain among gynecologic outpatients? How often do they require hospital admission and operative intervention?
2. What is the proportion of patients with chronic pelvic pain among patients scheduled for endoscopy?
3. What kind of anatomical changes are found during diagnostic laparoscopy in the background of symptoms?
4. What are the therapeutic alternatives for patients with pelvopathy based on positive or negative laparoscopic finding?
5. What is the role of endometriosis in chronic pelvic pain and infertility? What kind of treatment options are available for management of symptoms and signs?
6. Is there any connection between irritable bowel syndrome and chronic pelvic pain?
7. What kind of complications may occur during endoscopy and how can we prevent them?

## Patients

At our department we perform laparoscopies as of 1978. Between January 1st, 1979 and December 31st, 2002, 11681 patients underwent laparoscopy. Among them 1061 interventions were done for chronic lower-abdominal pain. We have retrospectively analyzed the data of 128 patients with endometriosis and infertility, 118 patients with endometriosis and pelvopathy, 154 patients with irritable bowel syndrome, and the complications of 6974

laparoscopic interventions. The cumulative data of patients with pelvipathy in two different two-year periods (1989-1990 and 1998-1999) were further analyzed in detail.

### **The surgical technique of laparoscopy**

Laparoscopy was performed without previous gas insufflation. The abdominal wall was simply elevated, a small skin incision was made at the laparoscopic puncture site deep enough to penetrate the fascia, then the trocar was inserted with gentle pressure into the abdominal cavity through the umbilicus. Once the laparoscop is inside the abdominal cavity, abdomen is inflated with CO<sub>2</sub>, then the patient is put in Trendelenburg's position thus allowing the inspection of the minor pelvis. Laparoscopies were performed under general anaesthesia with intratracheal narcosis. When the indication of diagnostic laparoscopy was pelvipathy the whole abdominal cavity was explored with special attention drawn to the region of appendix – coecum, sigma large intestine, and gall bladder.

## **Results**

### **Chronic lower-abdominal pain - laparoscopy**

Over the past 23 years we performed 11681 laparoscopies. Of them, 42.9 % was operative intervention. Chronic lower- abdominal pain was the indication in 1061 cases (9.08%). Pelvic adhesions were found to be the most common finding (19.8%), and in every sixth patient endometriosis was diagnosed as the etiology of pelvic pain (17.7%). We frequently found ovarian cysts, parametritis posterior, and in about 3% of patients chronic appendicitis. In 27.2 % of patients however, we haven't found any pelvic morphologic pathology as possible background of pain.

In two different time periods (1989-1990 and 1998-1999) we analyzed the clinical data of patients with pelviphathy in detail. We did not find any significant difference between patients with positive or negative laparoscopic finding with respect to age, body weight. However, in the group of patients with positive laparoscopic findings parity, number of miscarriages, ectopic pregnancies and elective pregnancy terminations were more frequent. In the group of patients with positive laparoscopic findings the number of adnexal operations, appendectomies, cholecystectomies, hysterectomies, and cesarean sections were significantly higher. Based on positive laparoscopic findings pelvic adhesions, endometriosis, and ovarian cysts were found most commonly (32.2%, 21.6%, and 10.4%, respectively). Eighty seven percent of diagnosed anatomical changes were corrected by laparoscopic surgery, and we proceeded to laparotomy only in 13 % of cases. During the operative interventions we often performed adhesiolysis, excision or laser / thermal coagulation of endometriosis, utero-sacral nerve ablation, cystectomy, myomectomy, and ventrofixation. A certain proportion of patients was managed conservatively. Patients with endometriosis were treated with GnRh analogues for six months. Four patients were given antibiotics and corticosteroids, 17 patients received non-steroid anti-inflammatory drugs (NSAID), 20 patients were treated with balneotherapy, and 24 patients were referred to other specialists.

In 27.2% of patients with chronic lower-abdominal pain laparoscopy has not revealed any pelvic pathology. In the group of patients with positive laparoscopic findings more than two third of operative interventions were performed at the time of diagnostic laparoscopy. Most common laparoscopic operative interventions were: adhesiolysis, excision of endometriosis, utero-sacral nerve ablation, cystectomy, ovarian resection, myomectomy, and ventrofixation of the retroflected uterus. For patients with negative laparoscopic findings long-term NSAID, oral contraceptive, GnRh analogue, and / or Detralex therapy may be applied together with sexual-psychological support. Endometriosis was diagnosed in more than 20% of patients

with pelvipathy, and in almost 10% of infertile patients. For this reason clinical data of these two groups of patients were further analyzed to find out, whether combined (laparoscopic, surgical and GnRh analogue) treatment of endometriosis could improve conception rate of infertile couples, and pelvic pain of patients with pelvipathy.

### **Endometriosis – infertility**

Over the study period 128 patients (primary infertility: 91 [75.7%], secondary infertility 37 [24.3%]) with endometriosis were treated for infertility (9.6 % of all infertile patients). The average age of patients was 29.1 years (range: 20-38), and the mean duration of infertility was 3.3 years (range: 2-9). The infertility workup was done at our infertility clinic, laparoscopy plays essential role in it. Staging of endometriosis was based on the modified american staging that was established during diagnostic laparoscopy. The distribution of patients in different stages of endometriosis is as follows: stage I – 4, stage II – 67, stage III – 39, and stage IV – 18 patients. As a result of the therapeutic regimen described in materials and methods of the 71 patients with mild endometriosis 46 pregnancies concieved (42 spontaneously and 4 IVF) over a three-year follow-up period. Of the 39 patients with moderate endometriosis 20 pregnancies concieved (13 spontaneously and 7 IVF), whereas of the 18 patients with severe endometriosis 5 pregnancies concieved (all IVF) during the same period. The mean time interval between onset of treatment and conception was 7.5 months. Over the study period there was no relapse of endometriosis in patients with stage I and II disease. In patients with stage III and IV endometriosis we detected 18 cases of relapse of disease, most commonly in retrocervical region and in the ovaries. Based on our results we can conclude that combined (laparoscopic surgical and GnRh analogue) treatment of endometriosis significantly improves fertility rate: in minimal and mild endometriosis by 64%, in moderate endometriosis by more than 50%, in severe endometriosis by 16%, overall

by 53%. Our results are similar to that of literature data about the efficacy of combined treatment of mild endometriosis in improvement of infertility.

### **Endometriosis – chronic pelvic pain**

We have treated 118 patients with endometriosis for chronic lower-abdominal pain. The average age of patients was 31.2 years, and the mean duration of persistence of chronic pelvic pain was 14.3 months. Stage I endometriosis was diagnosed in 3 patients, stage II disease in 51 cases, stage III and IV endometriosis in 43 and 21 patients, respectively. Dysmenorrhoea decreased after two-month treatment, however, further improvement was not detected. Dyspareunia remained unchanged. Chronic pelvic pain decreased significantly after three-month treatment and further improvement was observed by the end of six-month therapy. Tenderness at physical examination decreased only after three-month treatment and further improvement was found by the end of the six-month therapy. Similar changes were observed with respect to pelvic finding at bimanual examination.

### **Irritable bowel syndrome – pelvipathy**

In 154 patients with pelvipathy irritable bowel syndrome (IBS) was diagnosed or suspected according to the ROMA 1 criteria. In 7 of these patients (4.5%) laparoscopy revealed peri-appendicular and peri-sigmoideal adhesions. As a result of laparoscopic adhesiolysis patients' complaints decreased in 4 cases and disappeared fully in 3 patients. Although positive laparoscopic finding was observed only in small number of patients, we still suggest, that laparoscopy is indicated in suspected cases of IBS or in those IBS-patients, where conservative therapy failed.

## **Complications of laparoscopy**

Of the 6974 laparoscopies done between January 1, 1990 and December 31, 2002, sixty five complications occurred that required operative intervention or hospital admission and subsequent medical therapy. Inflammatory complication developed in 21.5% of all complications. Intestinal laesion occurred in 18 cases. We observed mild hemorrhage from small vessels in 16 patients. In four patients laesion of the epigastric artery occurred at the time of insertion of the accessory troqar that could be corrected by large stitch insertion under laparoscopic control. In three patients heavy bleeding started as a result of dissection of omental adhesions from abdominal wall. In these cases we had to proceed to laparotomy. Omental protrusion through the umbilicus was detected in two cases.

## **Discussion**

Elucidation of the etiology of chronic lower-abdominal pain by means of physical examination and / or indirect radiographic methods (X-ray, ultrasound) is difficult. Patients with chronic pelvic pain account for a significant proportion of gynecologic outpatients. Other specialists dealing with abdominal diagnostics (internal medicine, surgery) often face with the disease too. Laparoscopy allows detailed inspection of abdominal and pelvic organs, therefore it is reasonable to use this surgical technique in the diagnosis and therapy of chronic lower-abdominal pain of unknown origin. With respect to negative laparoscopic findings in patients with pelvipathy in the literature we can find conflicting data. Murphy and Jacobson found negative pelvic findings during laparoscopy in 20 and 23 % of patients, respectively. In contrast, Mc Bride and Liston detected pelvic anatomical morphological changes during laparoscopy in 50 and 76% of patients with pelvipathy, respectively. Our data are in accordance with that of Cunanan et al., who observed negative laparoscopic findings in 30%

of patients with lower-abdominal pain. The explanation for different results may be explained by different patient-characteristics and diagnostic / therapeutic regimen.

Chronic pelvic pain is a complex disease, for which no organic cause can be diagnosed in majority of cases. In these patients most likely vegetative neurosis may be the underlying problem. Their symptoms persist for longer period of time and they seek medical care in different outpatient wards without apparent benefit. Nevertheless, in about two third of patients with pelvipathy laparoscopically well defined anatomical changes can be diagnosed. In this sense previous adnexal operations (ectopic pregnancy), and appendectomies are of value. The wide scale of diagnosed pelvic adhesions suggest, that in patients with chronic lower-abdominal pain previous abdominal operations should be considered with caution.

The significance of laparoscopic diagnosis and therapy of pelvipathy can be summerized as follows:

1. Patients with negative abdominal findings, whose symptoms are of psychogenic origin usually get rid of their consciousness of disease, often of carcinophobia following laparoscopic surgery and counseling.
2. In patients with positive laparoscopic pelvic findings and negative pelvic physical examination finding the underlying pathology can be diagnosed precisely.
3. Two third of anatomical changes detected during diagnostic laparoscopy can be corrected immediately with minimal invasive laparoscopic surgery in tertiary referral centers supplied with appropriate equipment and trained personnel. In summary, we can conclude, that laparoscopy is indispensable in the diagnosis and therapy of patients with chronic pelvic pain.

## Conclusions

Based on my retrospective studies the following answers are given to the questions raised in „objectives” section:

1. In more than two third of patients with chronic lower-abdominal pain laparoscopy can diagnose the underlying pathology.
2. Around ten percent of diagnostic laparoscopies are performed for chronic pelvic pain.
3. Sixty percent of anatomical changes detected during diagnostic procedure can be corrected immediately with minimal invasive laparoscopic surgery in tertiary referral centers supplied with appropriate equipment and trained personnel.
4. Laparoscopy is indispensable in differential diagnosis of etiology of chronic pelvic pain and it is necessary for planning adequate management strategies.
5. In 21.6% of patients with pelvipathy endometriosis is the underlying pathology.
6. Combined surgical/medical treatment of endometriosis significantly improves fertility rate: in minimal and mild endometriosis by 64%, in moderate endometriosis by more than 50%, in severe endometriosis by 16%, overall by 53%.
7. Chronic pelvic pain and dysmenorrhoea caused by endometriosis decreased significantly after two-month surgical and medical treatment, however, further improvement after six-month medical therapy was not detected. Dyspareunia remained unchanged. Chronic pelvic pain decreased significantly after three-month treatment and further improvement was observed by the end of six-month therapy.
8. The observed prevalence of endometriosis and chronic pelvic pain in domestic fertile-age female population draws attention to this group of patients and suggests, that this disease should be considered as a public health issue.

9. In 4.5% of patients with IBS laparoscopy revealed extra-intestinal anatomical changes. As a result of laparoscopic interventions patients' complaints decreased or fully disappeared. We suggest, that laparoscopy is indicated in suspected cases of IBS.
10. The vast majority of complications of laparoscopic surgery occurred at the time of insertion of the trocar. By means of direct insertion of the laparoscopic trocar into the abdominal cavity the number of complications can be minimized. Most common complications of laparoscopy are intestinal injury and bleeding. They occurred in 4.5% of all procedures.