

Management of pseudomyxoma peritonei with repeated laparoscopic laser ablation

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Summary

Pseudomyxoma peritonei is an intra-abdominal neoplasm with obscure origin and an indolent but relentless course. The cause of death is usually malignant cachexia and/or metastasis following repeated laparotomy to evacuate the intraperitoneal mucinous material. Different combinations of treatment modalities including surgery, chemotherapy and radiotherapy have failed to effect a cure or proper control of the disease. We have evaluated the feasibility of laser therapy in two cases. The disease is well under control and the patients are well. Our recommendation is that repeated laparoscopic laser ablation should have a role in the treatment of pseudomyxoma peritonei.

Keywords: laparoscopy, laser ablation, pseudomyxoma.

Introduction

Pseudomyxoma peritonei is an uncommon and puzzling intra-abdominal neoplasm characterized by widespread peritoneal seeding with mucinous epithelium. This results in a massive accumulation of intraperitoneal gelatinous mucinous material, partly free and partly attached to the peritoneal surfaces and encysted in connective tissue. Pseudomyxoma peritonei is often associated with ruptured mucinous neoplasm of the ovary or the appendix, although the defect may be microscopic.¹ The pathogenesis could involve chronic spillage of neoplastic mucinous epithelium with subsequent implantation on the peritoneum, or peritoneal metaplasia into mucinous epithelium in response to an irritant effect of the spilled mucin.²

The management of this condition has long been a clinical challenge, and several therapeutic modalities have been tried, but none has proved satisfactory in eradicating the disease or controlling its progression. We have evaluated the feasibility of repeated laparoscopic laser therapy as a means of controlling the condition.

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Case report 1

A 36-year-old patient presented with a 2-year history of primary infertility. During laparoscopy for gamete intrafallopian transfer (GIFT), she was found to have clinical evidence of pseudomyxoma peritonei. The lesions were mostly seen in the pelvis with other deposits on parietal and visceral peritoneum and under the diaphragm. The clinical diagnosis was subsequently confirmed by histological examination of biopsies.

In view of the patient's reproductive aspirations, and bearing in mind the predicted relatively slow progress of the disease, a decision was made to proceed with GIFT. The treatment was successful at the first attempt and, following an uneventful twin pregnancy, the patient had vaginal delivery of two healthy female infants.

Following delivery, the patient underwent laparoscopic laser ablation of the pelvic and peritoneal deposits using carbon dioxide (CO₂) laser. A follow-up laparoscopy some 6 months later revealed the presence of considerable peritoneal deposits, particularly within the pelvis, with areas of confluent gelatinous tissue several centimetres in diameter. Further laser ablation was carried out with 10 laparoscopic procedures between 1992 and 1997, using a CO₂ laser (Sharplan 1055, Litechnical, Middlesex, UK) in combination with a Diode fibre laser (Diomed 25, Diomed, Cambridge, UK). Use of this combination improved access to the widespread lesions.

During the last laparoscopy in January 1997, the lesions were found to have regressed considerably and the surgical impression was that the disease had been significantly reduced. A further laparoscopic evaluation was scheduled for 6 months later and the patient remains in good health.

Case report 2

A 32-year-old patient presented with a 4-year history of primary infertility. Her previous medical and surgical history was unremarkable. General medical and gynaecological examination revealed no abnormality, and vaginal ultrasound scan showed a slightly enlarged right ovary and polycystic ovarian appearance.

Diagnostic laparoscopy confirmed the presence

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of polycystic ovaries and showed a lesion of about 3 cm in diameter on the right ovary. The lesion was a well-circumscribed, yellow, mucinous, multicystic mass which was clinically diagnosed as pseudomyxoma peritonei. The tumour was biopsied and then vaporized with the CO₂ laser. The other pelvic organs, together with the appendix, liver and parietal peritoneum, appeared normal. The histopathological examination of the specimens confirmed the diagnosis of pseudomyxoma peritonei associated with borderline ovarian mucinous cystadenoma.

The patient has remained well and another laparoscopic assessment some 6 months later showed her peritoneal cavity to be completely free of disease. She has recently given birth to a healthy male infant as a result of *in vitro* fertilization.

Discussion

These case reports illustrate the chronic course of pseudomyxoma peritonei. Although the aetiology of this condition remains an enigma, it is to be looked upon as a widespread, low-grade malignant change with an indolent but relentless course. It can, however, prove lethal because of large amounts of intraperitoneal myxoid material causing pressure effects and/or widespread peritoneal deposits, and later metastasis, commonly to the liver.³ In previous studies, tumour progression seems to have occurred in the majority of patients with a 50% 5-year survival. Adverse predictors of patient survival include weight loss, abdominal distension, invasion of other organs or occurrence of adverse side-effects from treatment.

Debulking surgery and irradiation therapy (radioisotope and external beam), and chemotherapy (both intraperitoneal and systemic) have all been advocated for the management of this condition.⁴ Although successful treatment has been claimed with intraperitoneal instillation of cisplatin,⁵ intraperitoneal 5-fluorouracil⁶ and argon beam coagulator,⁷ recurrent debulking surgery has been the standard treatment of choice.^{8,9} The disease seems to have a considerable degree of resistance to both chemotherapy and radiotherapy. Neither treatment is free from side-effects.

With the development of laparoscopic surgery it is understandable that modalities other than conventional treatment would be assessed, including the use of fibre, and CO₂, lasers, and even bipolar diathermy. However, their effectiveness may be influenced by the predicted physical effects of different lasers and by the extent and distribution of the deposits. The application of lasers as a new therapeutic modality may prove to be more effective than other treatment options, especially if used on

a repeated basis.¹⁰ In addition, it seems that laser treatment can provide the benefit of controlling the disease without the increased rates of complications from conventional treatment.¹¹

It might be expected that fibre lasers (e.g. Diode, Yag, KTP) used in the contact mode would be more effective than using a CO₂ laser, since the physical effects of the latter are limited to a considerable extent by contact with the fluid interfaces that exist as part of this tumour's substance. However, turning the power up to 50–60 watts, with the ability to use the Swiftlaze facility, appears effective. On the other hand, CO₂ laser would be safer for vaporizing lesions on visceral peritoneum, e.g. intestine.

The rarity of pseudomyxoma peritonei and the long follow-up requirements will continue to limit any significant evaluation of results obtained from the use of any type of laser, or other new methods of treatment. However, our limited experience shows that repeated laparoscopic laser ablation would have a role in the management of this disease.

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