The author replies

We thank Drs. Watson and Mathew for their valuable commentary on our paper "Laparoscopic surgery in the rat: beneficial effect on body weight and tumor take" [1].

Our hypothesis is that the reduced surgical trauma of laparoscopy is associated with less tumor take and growth. Experimental studies in rats have confirmed that tumor take and growth after laparoscopic surgery are significantly less than after laparotomy [1–3]. However, tumor growth and take in these studies were considered to represent the general response to surgical trauma. In our opinion, port site metastases are caused by local rather than general factors. Direct implantation of tumor cells in the abdominal wall during extraction of a specimen and displacement of free viable intraperitoneal tumor cells have been suggested as important factors in the development of abdominal wall metastases. Insufflation of gas in the peritoneal cavity appears to provide an excellent vehiculum to transport free cancer cells to port sites. Leakage of gas through or along trocars, a phenomenon we refer to as the "chimney effect" [5], probably predisposes to the development of port site metastases.

Drs. Watson and Mathew expressed their interest in an experiment with introduction of tumor cells at the commencement. We have recently reported the results of a study on the impact of CO₂ and gasless laparoscopy on abdominal wall metastases in rats [4]. In accordance with the study by Watson and Mathew we found significantly greater port site metastases in rats having CO₂ laparoscopy compared to gasless laparoscopy [6]. Therefore, further study on gasless laparoscopy in digestive cancer is required.

We concur with Drs. Watson and Mathew that the role of laparoscopic surgery in digestive cancer requires further evaluation, both in experimental and clinical studies.

References

1. Bouvy ND, Marquet RL, Hamming JF, Jeekel J, Bonjer HJ (1996) Laparoscopic surgery in the rat: beneficial effect on body weight and tumor take. *Surg Endosc* 10: 490–494
2. Bouvy ND, Marquet RL, Lamberts SWJ, Jeekel J, Bonjer HJ (1996) Laparoscopic bowel resection in the rat: earlier restoration of IGF-1 and less tumor growth. *Surg Endosc* 10: 567
3. Bouvy ND, Marquet RL, Jeekel J, Bonjer HJ (1996) Laparoscopic surgery is associated with less tumour growth stimulation than conventional surgery: an experimental study. *Br J Surg* (in press)
4. Bouvy ND, Marquet RL, Jeekel J, Bonjer HJ (1996) Impact of gas(less) laparoscopy and laparotomy on peritoneal tumor growth and abdominal wall metastases. *Surg Endosc* 10: 551
5. Kazemier G, Bonjer HJ, Berends FJ, Lange JF (1995) Port site metastases after laparoscopic colorectal surgery for cure of malignancy. *Br J Surg* 82: 1141
6. Mathew G, Watson DI, Rofe AM, Baigrie CF, Ellis T, Jamieson GG (1996) Wound metastases following laparoscopic and open surgery for abdominal cancer in a rat model. *Br J Surg* 83: 1087–1090

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