

## Letter to the Editor

### Regarding “Ultrastructural Investigation of Pelvic Peritoneum in Patients with Chronic Pelvic Pain and Subtle Endometriosis in Association with Chromoendoscopy”

To the Editor:

We did appreciate the nice pictures in the article on ultrastructural investigation of pelvic peritoneum in women with pain and endometriosis [1]. The use of methylene blue to stain and diagnose endometriosis or damaged peritoneal areas remains debatable since the original observation in 1994 [2].

We are interested to know the time interval between the beginning of laparoscopy and the peritoneal biopsy. Indeed, some of the changes observed could be explained by mesothelial cell trauma by the CO<sub>2</sub> pneumoperitoneum and/or by removing the biopsy specimen through the trocar. Indeed, over the last decade awareness has grown that mesothelial cells are extremely sensitive to any type of trauma and react within seconds by retraction. Exposure to CO<sub>2</sub> pneumoperitoneum thus leads to bulging of cells within 30 minutes of exposure [3]. Unfortunately, this article did not mention that in order to obtain their excellent scanning electron microscopy images in mice, *in vivo* fixation of the peritoneum had been necessary. Indeed, the time needed to take a peritoneal biopsy specimen by laparoscopy or laparotomy and the unavoidable exposure to CO<sub>2</sub> pneumoperitoneum or, worse, to air with 20% oxygen already induced important mesothelial changes. In addition, saline used for irrigation rapidly damages the mesothelium. This mesothelial reaction [4] and the consequences for postoperative adhesion formation and their prevention by conditioning were recently reviewed [5–7].

Because pathologists generally see more than can be described in an article, this comment is a suggestion to reconsider your results, especially the relationship with endometriosis by taking into account this rather recent observation of rapid mesothelial damage by CO<sub>2</sub> laparoscopy. In addition, we hope to increase awareness of this rapid mesothelial reaction because it is important for future studies on mesothelial morphology.

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## References

1. Mehdizadehkashi A, Tahermanesh K, Fazel Anvari-Yazdi A, et al. Ultrastructural investigation of pelvic peritoneum in patients with chronic pelvic pain and subtle endometriosis in association with chromoendoscopy. *J Minim Invasive Gynecol*. 2017;24:114–123.
2. Manhes H, Shulman A, Haag T, Canis M, Demontmarin JL. Infertility due to diseased pelvic peritoneum—laparoscopic treatment. *Gynecol Obstet Invest*. 1994;37:191–195.
3. Volz J, Koster S, Spacek Z, Paweletz N. Characteristic alterations of the peritoneum after carbon dioxide pneumoperitoneum. *Surg Endosc*. 1999;13:611–614.
4. Mutsaers SE, Prele CM, Pengelly S, Herrick SE. Mesothelial cells and peritoneal homeostasis. *Fertil Steril*. 2016;106:1018–1024.
5. Koninckx PR, Gomel V, Ussia A, Adamyan L. Role of the peritoneal cavity in the prevention of postoperative adhesions, pain, and fatigue. *Fertil Steril*. 2016;106:998–1010.
6. Koninckx PR, Gomel V. Introduction: quality of pelvic surgery and postoperative adhesions. *Fertil Steril*. 2016;106:991–993.
7. Gomel V, Koninckx PR. Microsurgical principles and postoperative adhesions: lessons from the past. *Fertil Steril*. 2016;106:1025–1031.

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