First, in our experience of over 400 fetoscopies for a variety of causes, CMS is most frequently found within the first days, and less commonly within weeks after surgery. Most frequently, it is first found in the vicinity of the fetoscopic entry site or at the level of the internal cervical os. In that case, it is associated with higher incidence of PPROM, especially in the latter localization [2]. It would be good to know whether CMS was or was not present immediately after surgery, and if so, where, as to suggest a causative relationship.

Secondly, we are not agreeable with the authors' statement that CMS is more frequent following fetoscopy compared to 'open' fetal surgery. Their statement is based on a study of Sydorak et al. [3] in which the very high rates of CMS reported after fetoscopy [30/66 (= 45.5%)]. These were most probable related to the technique used including multiple ports with high flow amniotic fluid exchange pumps. Moreover, that incidence of CMS is not statistically different from the incidence reported after open fetal surgery [5/12 (41.7%)] in the same paper. Meanwhile, percutaneous single-port fetoscopic techniques have been widely practiced worldwide now, with much lower (but still clinically relevant) rates of CMS and subsequent PPROM [4]. One can therefore safely state that fetoscopic surgery is less invasive, not only to the mother, but also to the uterus and fetal membranes.

Finally, in open surgery, specific closure techniques to obtain bloodless closure of the uterine cavity, attaching the fetal membranes to the uterine wall and reducing the risks for CMS. In analogy to that, one could contemplate doing the same primarily at the time of fetoscopy. In animal experiments, it was shown that collagen plugs can be used to seal the membrane defect, a technique that is amenable to percutaneous placement [5]. The collagen plug may act as a physical barrier, fix or lock the fetal membranes against the uterine wall at the end of the procedure and as such reduce the risks for CMS and PPROM and/or potentially reduce pre-existing CMS. Indeed, we recently had a case of complete CMS following immediately after an uneventful 12 min fetoscopic endoluminal tracheal occlusion (FETO) procedure. The patient was kept on relative bedrest and no further treatment was attempted until the time of elective balloon removal at 33.6 weeks, where we used a collagen plug (fig. 1a). The day after the second fetoscopy and sealing of the entry site, the typical CMS ultrasound appearance was no longer visible (fig. 1b). The plug could be demonstrated, like locking the fetal membranes against the uterine wall. Further clinical evaluation is underway to evaluate the potential benefit of this approach for all fetal interventions involving large (2–3 mm) instrumentation in the uterus.

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Reply

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To the editors

With our limited experience in fetoscopy, we also noticed and agreed that chorioic membrane separation (CMS) most frequently happens within a few days after surgery and it was a very unusual and in-

teresting clinical finding for such a delayed CMS to have occurred as reported in our case.

Open fetal surgery is not performed in our center and the statements concerning CMS have to be based on the reports avail-

able in the literature. We congratulate Devlieger and co-workers for developing special techniques in this field and their hard work in managing CMS and preventing the PPROM associated with these invasive procedures.