Ultrasound fetal virtual autopsy: Can water help?
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Objective
To evaluate the usefulness of an artificial water surrounding to improve the result of virtual autopsy using ultrasound.

Methods
After being placed in a transparent bag filled with plain water to simulate a thin artificial womb, fetuses were given a complete examination by a physician experienced in prenatal ultrasound. After this procedure autopsies were performed by a pathologist. A sequential sample of 20 second trimester fetuses (18 to 39 wg ) where pregnancies were terminated for structural defects or due to intrauterine death was used. (transposition of great vessels, trisomy 16, diaphragmatic hernia, chorioamnionitis, unknown cause of death, brain hemorrhage, polymalformative syndromes). No cases were excluded.

Results
All ultrasound examinations were easily performed. Good visibility for bones, brain, liver, kidneys, spine, lungs, and diaphragm, but poor results for heart and vessels. All the measurements were easily done, including fetal facial angles. All structural defects accessible to ultrasound were seen by this method (100%). The autopsy outperformed ultrasound by showing more signs in 40% of cases. The ultrasound was superior to autopsy in one case where the brain was too deteriorated to be examined by autopsy.

Conclusion
At this time, autopsy can't be outperformed by any kind of imaging and remains the gold standard. However, as a non-invasive examination ultrasound could be used as a tool for virtual autopsy, and with water-surrounding it is much superior to assess fetal anomalies with excellent visibility for the brain, liver, kidneys, spine, diaphragm and bones; but shows poor results for examining the heart. It could also be a handy tool for studies involving those organs and fetal weight estimations. Because we artificially recreate the prenatal environment, this method could be used to improve efficiency of prenatal diagnosis by ultrasound as we can compare imaging and real findings at the same time.