Is it possible to measure the abdominal pressure-volume relation with three points?

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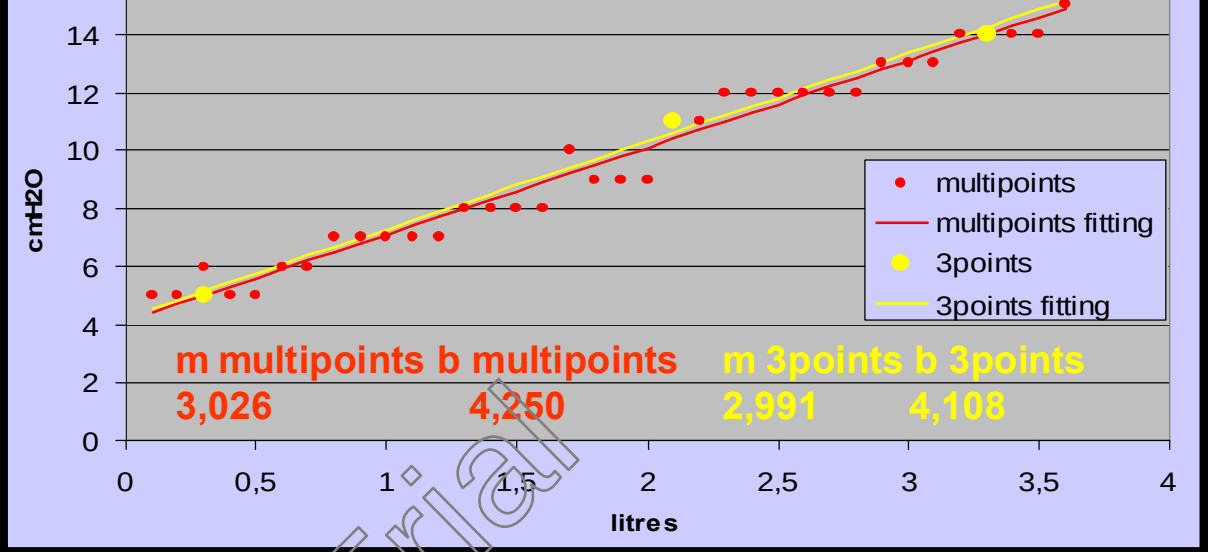
Goal of Study

The abdominal pressure-volume relation (APVR) can be calculated by measuring many pressure-volume points during insufflation. Goal of the study was to test the hypothesis that measuring three points should be sufficient to calculate the APVR.

Methods and Analysis

- 10 Patients, ASA class I, II or III, 21 to 75 years,
  - no previous abdominal intervention.
  - scheduled for a laparoscopic surgery.
  - approved by the hospital ethical committee.
- Anaesthesia was induced with Propofol 200 mg, Sufentanil 20 ug, Nimbex 0,2 mg/kg and Sevoflurane 1,5 Mac in a 50 % O2/N2O.
  - bladder empty before surgery.
  - stomach emptied by suction through a gastric tube.
  - All the CO2 was allowed to escape after insertion of the trocar.
- The insufflator Olympus UHI-3 was initialised and a stepwise insufflation at a flow of 1 l/min was given.
  - Measurements were taken every 100 ml till the abdominal pressure reached 15 cmH20. These multi data points were fitted to a line.
  - All the CO2 was then allowed to escape.
- The insufflator was reinitialised and a high flow insufflation till 7, 11 and 15 cmH20 was given.
  - At each pressure set the actual pressure and volume were measured when the flow stopped. These 3 data points were fitted to a line.

Results



- The multipoints and the 3points measurements give both an m and b. The m's and b's were compared by a paired t test.

	m 3points	b 3points	m multipoints	b multipoints
mean	3,970	5,680	3,867	5,510
Stdev	1,395	1,377	1,385	1,417
T test	0,195	0,253		

- No statistical significant difference was found between both groups with a paired t test.

Conclusion

- The APVR can be measured with three points initial and during the procedure.
- This allows a measurement in all patients and a fast evaluation during the procedure.