Impact of patient position on the abdominal elastance (E) and pressure at zero volume (PV0)

Reusens H.[1] , Van der Fraenen D. [1], Mulier J.P. [2], Van Cauwenberge S[1]., Dillemans B.[1]
1. Dep of general Surgery AZ sint Jan Brugge-Oostende, Belgium
2. Dep of Anaesthesiology AZ sint Jan Brugge-Oostende, Belgium

Contact Email: jan.mulier@azbrugge.be
More info: www.publicationslist.com/jan.mulier

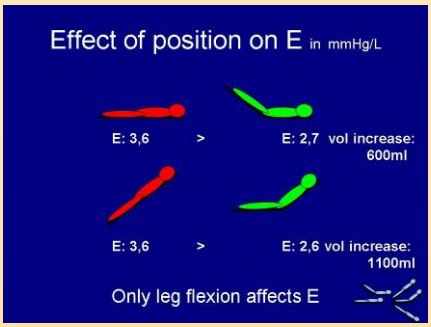
Background and Goal of Study

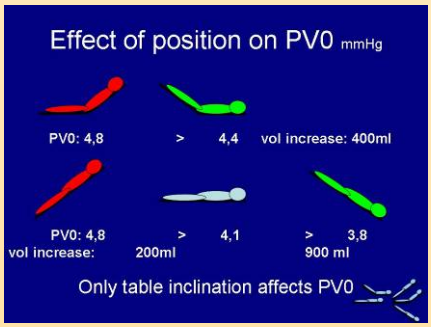
- We found that the beach chair position increased the surgical workspace. (1)
- the Mulier abdominal model is used to calculate E and PV0.(2)
- The goal of this study was to measure the effect of a change in the patient's position on
  - the abdominal elastance (E)
  - the pressure at zero volume (PV0)

Materials and Methods

- The abdominal pressure volume relation was measured in 10 patients undergoing laparoscopic surgery as previously described (1) and approved by the hospital ethical committee.
- This measurement was taken with the thorax horizontal and the legs horizontal or 30°flexed, the thorax in the reverse trendelenburg (30°) position and the legs horizontal or 30°flexed, or the thorax in the trendelenburg (30°) position.
- E and PV0 were calculated for each position and an analysis of variance was performed on repeated measurements.

Results





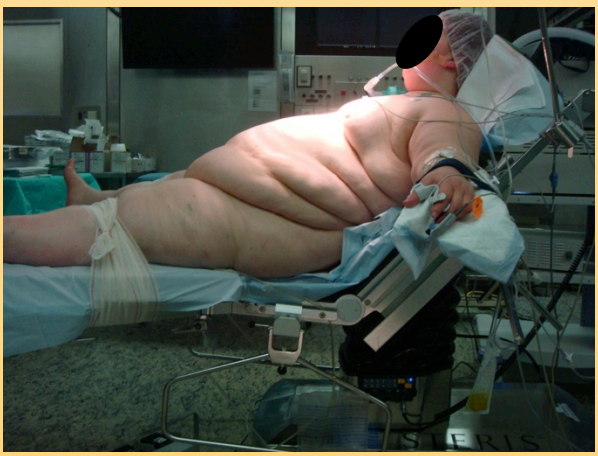
- Flexing the legs lowered E significantly from 3.6 to 2.6 mmHg/L without affecting the PV0.
- Reverse trendelenburg increased PV0 by 0.7 mmHg and trendelenburg decreased PV0 by 0.3 mmHg without affecting E.
- The ideal position, the trunk horizontal and the legs flexed, increased the abdominal volume by 1000 ml at 15 mmHg in comparison with the horizontal position without leg flexion.
- Reverse trendelenburg without leg flexion, the worst position, decreased the volume by 200 ml.

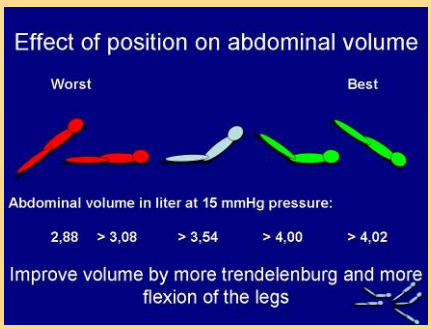
Conclusion

- When reverse trendelenburg is needed to give the surgeon access to the upper abdomen it should be minimal and the legs should be flexed as much as possible to maximize the surgical workspace.

References

- 1. Mulier J. Surg Endosc 2010, 24: 1398 Impact of patient's body position on the intra abdominal workspace during laparoscopy.
- 2. Mulier J. ISPUB 2009, 21: 1 On the abdominal pressure volume relationship.





EAES Torino 15-18 06 2011