

Hypothesis / aims of study

Intra-abdominal pressure (IAP) was defined as the steady state pressure concealed within the abdominal cavity. Intra-abdominal pressure (IAP), intra-abdominal hypertension (IAH), and the abdominal compartment syndrome and pathophysiology has become the focus of attention in many disciplines. A normal IAP varies from sub-atmospheric values to 7 mmHg in normal weight individuals, with higher baseline levels in morbidly obese patients of about 9 to 14 mmHg. Intra-abdominal hypertension (IAH) is defined as a sustained increase in IAP ≥ 12 mmHg. The adverse physiologic effects of increase intraabdominal pressure impact pulmonary, cardiovascular, renal, splanchnic, musculoskeletal and central nervous systems. However little concern has been dedicated to the potential importance of the structure of the abdominal compartment and its compliance. Abdominal compliance is defined as a measure of the ease of abdominal expansion, which is determined by the elasticity of the abdominal wall and diaphragm. The abdomen may be considered a closed box. This box has rigid structures, spine and pelvic bones, partially flexible sides of abdominal wall and diaphragm. Levator hiatus is the opening of this closed box to atmosphere. Pelvic organ prolapse might be the consequences of compensation of abdominal compliance to chronic increased intraabdominal pressure. We hypothesized that we disturb this feasible compensation with relatively stable reconstructive procedures like sacrocolpopexy or colpocleisis. The aim of this study was to evaluate the effect of pelvic reconstructive surgery in patients with severe uterovaginal prolapse on intraabdominal pressure. The correlation between patient characteristics and IAP was evaluated.

Methods and Materials

This prospective study was approved by local ethical committee. Oral and written. Informed consent was obtained from all patients. Thirteen stage 3 or 4 pelvic organ prolapse patient patients were enrolled prospectively. IAP was measured by a single investigator at preoperatively before pelvic organ prolapse reconstruction procedure. Measurements were performed before any general or spinal anaesthesia. The second measurement was performed 24 week after operation. IAP measurements were obtained with the patient in fully supine position without head of bed elevation and at the end of expiration, according to the recommendations by the World Society of the Abdominal Compartment Syndrome. The mid-axillary line at the level of the iliac crest was used as zero-reference point. IAP was measured using a Foley Manometer Low Volume (Holtech Medical, Charlottenlund, Denmark). In case of an empty urinary bladder or the presence of air-bubbles obstructing a continuous fluid column in the FMLV, 50 ml of 0.9% sterile sodium chloride solution was injected via the sample port. The urinary bladder catheter was clamped distal to the port to ensure an open pressure conductive fluid column. When fluid in column stabilized corresponding value of IAP was recorded. Intra-abdominal hypertension is defined by an elevation in IAP ≥ 12 mmHg. Two sided paired student's t-test was used for to compare the IAP values before and after the pelvic reconstrictive surgery as sacrocolpopexy and colpocleisis.

Results

Thirteen women with stage 3 or utero-vaginal prolapse 4 according to Pelvic Organ Prolapse Quantification (POP-Q) system had undergone 12 sacrocolpopexy and 1 colpocleisis operation. Mean IAP was significantly higher after pelvic reconstructive surgery (5.6 ± 2.4 mmHg) than before surgery (8.6 ± 2.5 mmHg) ($p=0.001$). Age, weight, body mass index, waist circumference of patient or type of operation did not correlate with preoperative or postoperative intraabdominal pressure. IAP of seven (53.8%) patients raised over 7 mmHg, 2 of 13 (15.3%) had intraabdominal hypertension.

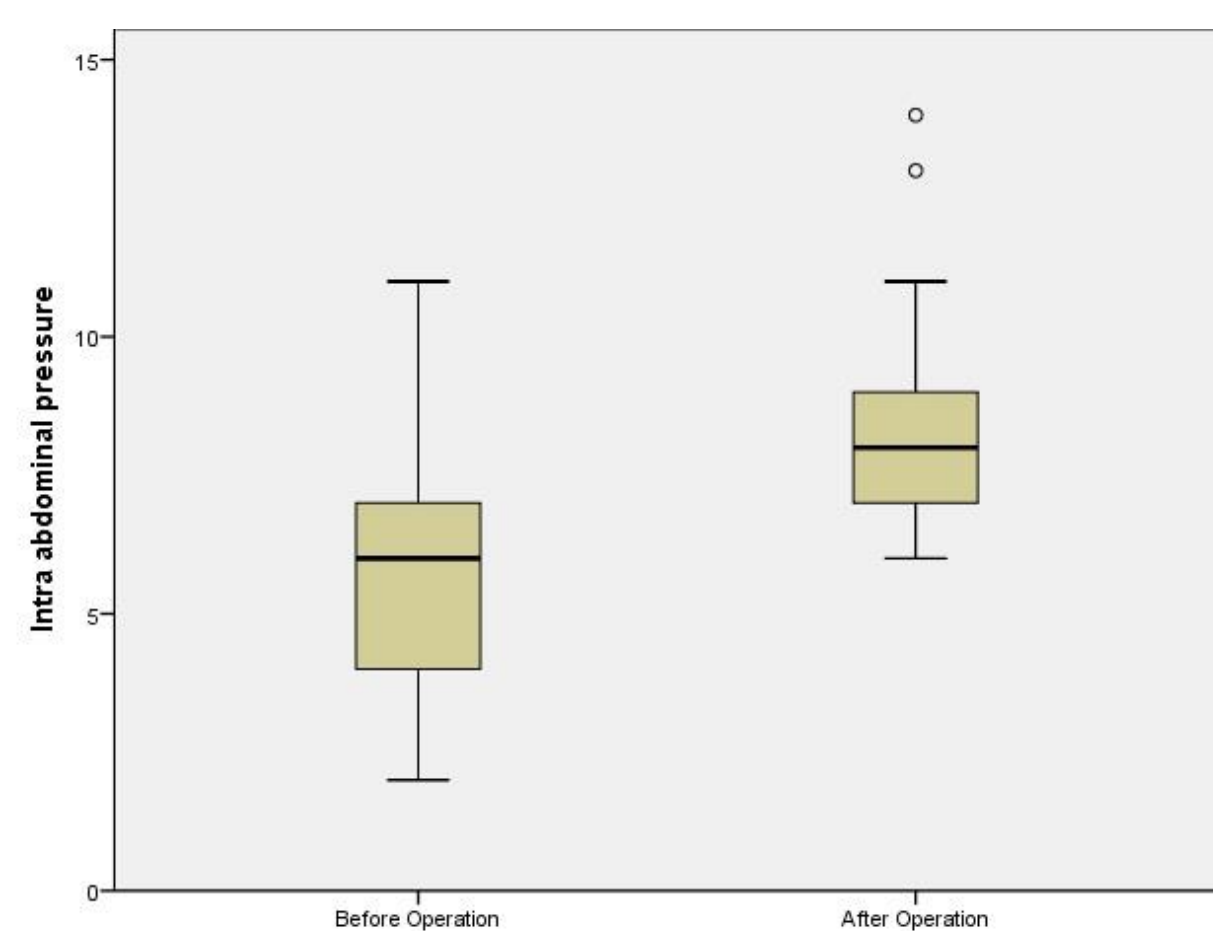


Chart 1. Intraabdominal pressure before and after pelvic reconstructive surgery.

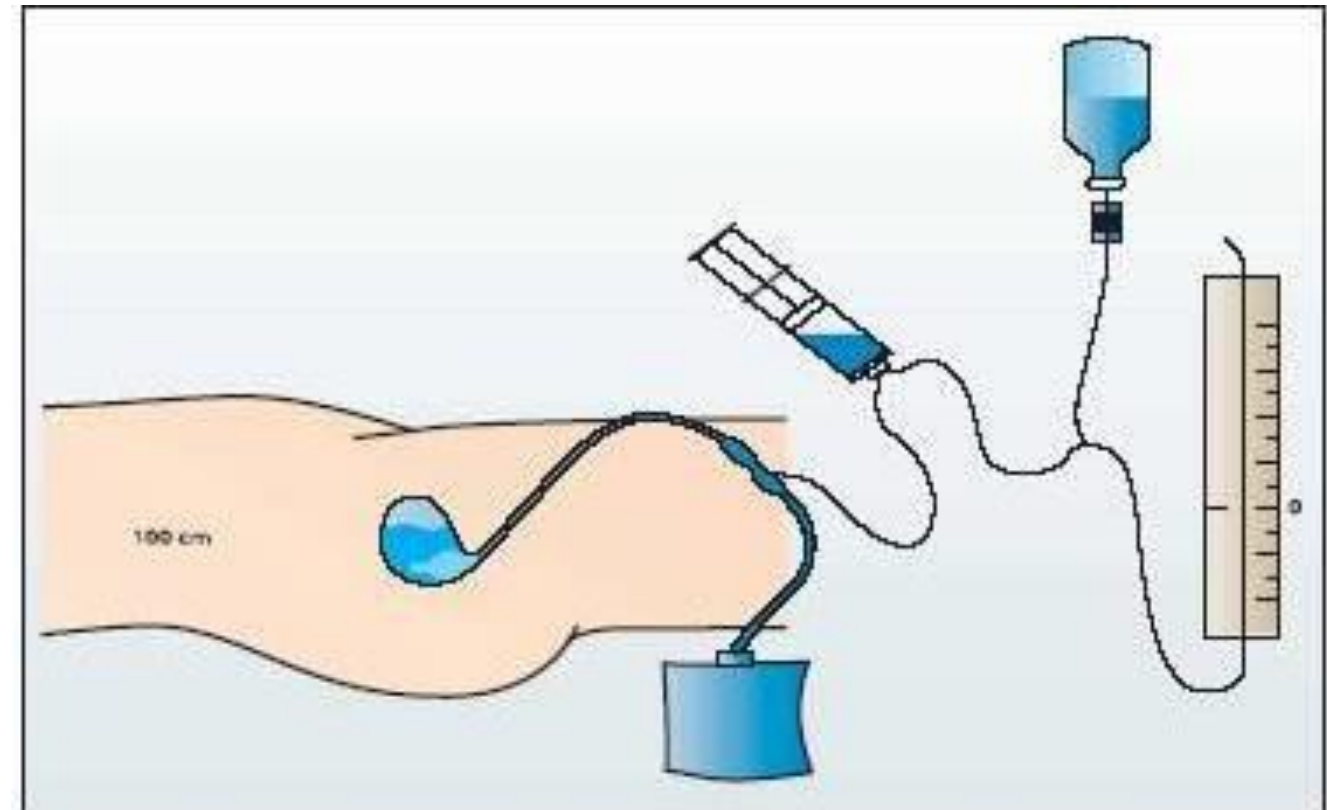


Figure 1. Schematic representation of intraabdominal pressure measurement.

Interpretation of results

Uterovaginal prolapse may be compensatory response to increased intraabdominal pressure. Reversal of compensatory uterovaginal prolapse with long lived reconstructive or obliterative surgery can explain our increased intraabdominal pressure after surgery. It can cause longterm unfavourable multisystemic consequences in longterm especially in fragile women

Concluding message

IAP significantly increases after pelvic reconstructive surgery to normal values after delivery. Increased intraabdominal pressure after reconstructive pelvic surgery may be associated with long term unfavorable health consequences. The relation of increased intraabdominal pressure and pelvic organ prolapse should be evaluated with well designed studies.

References

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