

# Abdominal paracentesis (pediatrics)

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## Indication and procedure

- **Abdominal paracentesis** is carried out in acutely or chronically ill children with ascites, for diagnostic or therapeutic reasons;
- removal of big volume of fluid is important for releasing the pressure from ascites to the diaphragm in respiratory distress or pressure on renal veins in oliguria;
- appropriate analgosedation is essential;
- patient is lying down, the upper part of the body is elevated above 30 degrees;
- the urinary bladder must be empty (the child will urinate or will be catheterized);
- the procedure is done with sterile technique, using 1% mezocain for local anesthesia;
- the site of puncture is in 1/3 distance between the umbilicus and spina iliaca anterior superior or in 1/3 distance between the umbilicus and symphysis;
- intravenous cannula (size G 22 to 18) with fixed syringe is placed through the abdominal wall with small suction, during the passage through peritoneum we feel sudden release of pressure; afterwards we insert only cannula and the needle is removed;
- in order to prevent hemodynamic instability in patient with masive ascites, we evacuate only the amount necessary for examination the ascites from the peritoneal cavity;
- during therapeutic paracentesis we pull out the fluid slowly and in case of hemodynamic instability we use i.v. colloid solution;
- this method can be also used for placing the peritoneal catheter in peritoneal cavity in patient with renal failure or catheter for peritoneal lavage in patients after the injury



## Complications

A bowel perforation usually results without the consequences because the opening after the puncture is closed early. A vessel perforation can arise in intraperitoneal or in extraperitoneal space. The opening is usually closed rapidly also but the hematoma may occur. Bacterial contamination of peritoneal cavity occurs due to breaking the aseptic principles or the contamination from the bowel perforation which is not closed. The rapid evacuation of a huge volume of ascites with subsequent transfer of intracelular fluid to extracelular space can lead to hypotension.

## Examination of the peritoneal fluid

**The peritoneal fluid is** examined for the amount of the red blood cells, leukocytes, including differential blood count, biochemical parameters (glukose, total protein, fibrinogen, amylase,, ammonia), cytology, microscopy (using the Gram stain), and cultivation.

The peritoneal fluid is transparent to straw yellow coloured. The clouding is apparent in chemical or infectious peritonitis. Milky or white-yellow fluid is typical for chyloisis ascites. Green colour occurs during perforation of the gall bladder or the choledochus or in inflammation of the peritoneum resulting in pancreatitis. Bloody coloured fluid refers to traumatic punction or the laceration of the abdominal organ.

The number of leukocytes  $> 500/\text{mm}^3$  with majority of polymorfonuclears in differential blood count occurs in bacterial peritonitis. With chyloisis ascites or TBC peritonitis the differential blood count is dominated by lymphocytes. During ascites associated with tumors we can see cancer cells. The glucose level  $< 3,33 \text{ mmol/l}$  or  $< 2/3$  glycemia appears in cases of tumor or bacterial peritonitis.

## Characteristics of transudate and exsudate

### Transudate

- protein  $< 25 \text{ g/l}$ ,
- ration ascites protein /serum protein  $< 0,5$ ,
- fibrinogen  $0,3\text{--}0,5 \%$  of total protein,
- specific weight  $< 1015 \text{ g/l}$ .

### Exsudate

- protein  $> 25 \text{ g/l}$ ,
- ration ascites protein /serum protein  $> 0,5$ ,
- specific weight  $> 1015 \text{ g/l}$ .

The levels of ALP are in patients with necrotic or perforated large bowel > 2× higher in comparison with normal serum level.

The level of ammonia is higher 2× more in patients with bowel strangulation or with perforated duodenal ulcer.

In case of diseases of uropoetic system the ascites fluid has a high amount of ammonia, creatinine and potassium. The level of amylase higher than in serum is in pancreatitis, pancreatic pseudocyst, bowel perforation or strangulation.

## Links

### References

- HAVRÁNEK, Jiří: *Abdominální punkce*. (upraveno)

### Related articles

- Ascites