Complications following central neuraxial blockades (CNB).

A comparison of risk in non-obstetric compared to obstetric patients.

Picture 2

This was a hot topic around the millennium: There were reports of severe complications from the US, and the cause of spinal haematomas (SH) were believed to be the larger dosage of thromboprophylactic medications in US compared to Europe.

However, Dahlgren and Törnebrandt had published a report from Lund, Sweden, the identified 17 severe complications following 18000 CNBs.

Therefore, we (Irestedt, Dahlgren and Moen) performed a retrospective study in Sweden.

Pictures 3-5

We identified a high number of SH in the decennium 1990-1999, similar to the incidence described in US. Particularly, we found a very low incidence of SH in the obstetric population compared to the non-obstetric patients. Other studies and meta-analysis have confirmed this difference.

Also, complications in the obstetric population are rarely severe.

It is therefore important to recognise the higher risks of complications in the non-obstetric patients.

The number of epidural blockades provided for non-obstetric patients has decreased significantly the last 15-20 years, not because of the higher risks of complications, but because epidurals are less needed; The LIA technique in knee arthroplasty, laparoscopy instead of laparotomy, endovascular techniques have all reduced the indications for epidural blockades.

Most epidurals are now obstetric, but the risks in the non-obstetric population remain significantly higher, and this should not be forgotten.

Picture 6

I will in this presentation describe SH and the infectious complications meningitis and epidural abscess.

Pictures 7-8

SH very rarely occurs after spinal blockades- about 1: 500 000 in all patient groups.

A meta-analysis found the risks of SH in obstetric patients 1: 167 000. SH occurs almost exclusively in women who have developed coagulopathy after the epidural was administered.

The healthy parturient therefore carries a significantly lower risk of SH. The parturient who develops coagulopathy is at a higher risk, difficult to quantify. However, this implies that women in this patient group should be closely monitored.

Pictures 9-11

The risk of SH is significantly higher not only in the orthopaedic group, but also in general surgical patients.

Several risk factors related to the patients are identified (in addition to drugs that affect coagulation).

Renal failure cause a non-quantifiable risk, previously not identified.

Pictures 12-13

However, the age-induced changes in the vertebral spine cause the spine to become more narrow, and close the vertebral foramina.

Picture 14

The radiologic image of an aged spine in an otherwise healthy 82 yr old is illustrative.

Pictures 15-17

Usubiaga already in 1967 showed how decreased compliance in the aged spine changed the consequences and effect of injections of local anaesthetic and radiologic contrast in the elderly compared to the younger patients.

In the years when we used epidural anaesthesia for knee arthroplasty all these effects were evident in our daily practice; a lumbar epidural could give high level of anaesthesia but in sufficient motor blockade in the legs.

Picture 18

This image comes from a very illustrative case rapport.

A 92 yr old woman received thoracic epidural blockade for abdominal surgery, not without difficulty, several attempts and at least one dural puncture. Postoperative analgesia was obtained with 5ml/h of local anaesthetic mixed with opioid. After two days she became paraparethic, the epidural infusion was discontinued, and an MRI showed medullar compression caused not by blood, but by local anaesthetic, possibly mixed with CSF.

Already in the radiologic department she started to move her legs and was later completely recovered. This showed how 5 ml/h exceeded the draining capacity of her aged spine.

Pictures 19-21

One should not expect pain to be the first symptom of SH!

Pain is often described following spontaneous SH- as a rupture of arterial aneurism will cause ischaemic pain. The slower filling from a venous bleeding will not necessarily cause pain.

Pictures 22-23

Removal of the epidural catheter is as risky as its administration- this should be remembered!

And the symptoms may appear after several days. The patient should be observed closely at least 24 hours after epidural removal.

Picture 24

Short time necessary from debut of symptoms of SH to surgical intervention- all procedures should be planned and ready in advance. Unfortunately, the opposite is often the case.

Picture 26

We found 29 cases of iatrogenic meningitis in our Swedish study- but probably not because we are dirtier than other nations. Baers review of iatrogenic meningitis is very informative-read it!

Pictures 27-29

There is no risk group for this complication- even the healthiest person may develop meningitis whenever bacteriae are introduced into the CSF.

In the western countries iatrogenic meningitis is almost exclusively caused by alpha-haemolytic Streptococchi, aka S viridans. and the most common bacteria in this group is S Salivarius (that causes caries in your teeth).

S Viridans are commensals of the upper airway NOT of the skin, and contamination is easily inhibited by the use of a face mask. However, many colleagues in other specialities omit the face mask, and are oblivious to the risk their patients threfore are exposed to.

Also- polymerase techniques show the origin of the bacteriae; the performer of the spinal (or myelography, or lumbar puncture.) Iatrogenic meningitis has occurred also after LP.

When iatrogenic meningitis occurs the patient should initially be treated with antibiotics as in community acquired meningitis. Tracing with PSR should include patient, assistant and performer. Unfortunately, this has never been done is Sweden, at least that I know of, even if the latest case was in 2020.

Pictures 31-36

Epidural abscess (EA).

The duration of epidural catheterisation is directly linked to the development of EA, explaining the low incidence in the obstetric population. But when a “prophylactic” obstetric epidural is performed, the risk of EA is significantly increased, as illustrated by a recent Swedish case.

Special care to sterile technique should be adopted in these cases.

Patient with epidural analgesia for thoracic trauma appear to be at particular high risk.

Symptoms are well described, and are the same in spontaneous and iatrogenic EA. Pain and fever may have several causes in the postoperative or trauma patient, and therefore the diagnosis may be delayed

Suspicion may be enhanced by **local signs** of infection.

Radicular pain is a very important symptom and when radicular pain occurs, deterioration may be imminent. Unfortunately, the patient may not recover if surgery is performed once neurologic impairment has occurred.

Picture 38

Obstetric neuropathies. See Liedholms lecture!

Picture 40

Often forgotten: thoracic epidurals may cause thoracic symptoms: The patient might not have the strength to sit, or to eat. Observing according to the Bromage scale will not detect this.

Pages 37-42

Diagnostics: Believe the patient, believe what you see. Search for objective support for your diagnosis.

Kalm January 12th 2023

Vibeke Moen