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POST EPIDURAL-ANAESTHESIA HAEMATOMA

Rare but Devastating!!

With the recent launch in South Africa of Arixtra® (fondaparinux) by GSK, our attention has once again been focussed on the use of anti-coagulants for DVT prophylaxis and neuraxial anaesthesia/analgesia. It is, therefore, very topical that we take another look at the potential complication of epidural haematomas in the **spinal canal**. Intra-cranial epidural haematomas will not be dealt with.

Although epidural haematomas following spinal or epidural anaesthesia appear to be rare, this could be from under reporting. Also, as progressively more neuraxial anaesthesia is performed, especially in patients who require anti-coagulation, the incidence will increase so it behoves us all to be especially on the lookout for this potential complication which is both catastrophic and devastating - not only to the patient but to the anaesthetologist as well.

Interestingly, these epidural haematomas can be either **spontaneous** or **NON-spontaneous**.

SPONTANEOUS EPIDURAL HAEMATOMA:

These can occur in the lumbar, thoracic or cervical areas and in all age groups.

Possible cause include

1. Oral anti-coagulation
2. Haemophilia A
3. A-V Malformations
4. Hypertension
5. Blood dyskrasias
6. Arachnoid cysts
7. Minimal trauma such as straining particularly combined with any of the above.

The significance of this type of haematoma to anaesthetologist is that they may occur in the patient on whom you performed an epidural anaesthetic as a totally unrelated event. This should always be born in mind when evaluating a case of epidural haematoma.

NON - SPONTANEOUS EPIDURAL HAEMATOMA:

Possible causes include:

1. Spinal trauma.
2. Invasion of the epidural space:
 - a. Spine surgery
 - b. Neuraxial anaesthesia
 - c. Epidural Steroid injections for pain

The characteristics of the two types of haematoma also differ slightly

SPONTANEOUS

These haematoma often have a 'slightly' 'worse' outcome (Both relative terms). The reason offered for this is that they are often larger in volume and involve multiple spinal levels and often when they occur the patient is not already under medical care and it takes time to receive medical care

NON SPONTANEOUS

'Often' have a 'better' outcome. They tend to be smaller in volume and the patient is often already under medical care so time to operation is usually shorter –provided that the care and monitoring is up to standard.

EPIDURAL HAEMATOMAS AFTER EPIDURAL ANAESTHESIA

Because the incidence of haematoma is low, to identify factors that are directly contributory is impossible, There is, however, a strong correlation between the incidence of epidural haematomas and :

1. Difficult techniques with multiple attempts at multiple levels
2. A bloody tap. The definition of a bloody tap is not clear as it ranges from slightly discoloured local anaesthetic coming back through the needle to frank blood. Both scenarios imply a breached blood vessel which can increase the changes for a haematoma.

3. Anti-coagulation. Every centre should have protocols in place for handling patients on anti-coagulation receiving neuraxial blocks. There are no hard and fast rules but ASRA and ESRA do have consensus statements which should be seriously taken into consideration in these patients. Communication between anaesthesiologists, surgeons, physicians and intensivists must be good in these patients to prevent permanent paralysis of the patient
4. Removal of the indwelling catheter – again very important in patients on anti-coagulation – haematomas have occurred up to 6 days after removing the catheter

It is interesting to note that in a number of reported cases the haematoma developed at a level quite remote from the epidural injection level. **Perhaps these are then spontaneous haematomas and totally unrelated to the anaesthetic.** This is an important to remember when it comes to 'apportioning blame'.

DEALING WITH THIS POTENTIALLY DEVASTATING COMPLICATION

1. **RECOGNITION** - Successful recognition depends hugely on awareness

a. The Doctor:

Should be AWARE that it can occur and that it DOES occur – up to 6 days after catheter removal

b. Hospital staff

Must be 'coached' by the anaesthesiologist performing the epidural regarding the importance of this complication, thorough monitoring and timeous raising of the alarm.

c. Patient

The patient MUST be involved and must be coached by the anaesthesiologist to raise alarm if he experiences new pain or recurring weakness or paralysis – once the epidural has regressed **THESE ARE NO LONGER THE EFFECT OF THE EPIDURAL** – epidurals with local anaesthetic do NOT recur.

2. SYMPTOMS AND SIGNS

- a. Back Pain which can be 'new' localised in the back, of sudden onset, 'excruciating'
- b. Radicular (Irritation of the nerve root by blood)

c. Progressive paresis or paralysis

- d. Cauda Equina signs - bladder or rectum incontinence

All of these symptoms and signs can be clouded by fading local anesthetic effects, which makes impeccable monitoring, especially of motor function in the postop period absolutely mandatory.

3. MONITORING

Monitoring of all patients who have had an epidural injection, but especially those with indwelling catheters and/or on anti-coagulation, must be impeccable, consistent and standardised.

To achieve these ends, the co-operation of the hospital staff and management is essential.

Training of the staff by anaesthesiologists must be unrelenting.

A GOOD GOLDEN RULE (to teach the staff) IS:

"The patient MUST be able to move something on his legs, even if just dorsiflex his toes or foot, the **WHOLE** time than an epidural is working in the postoperative period.

If the movement becomes weaker and goes away or does not return within 4-5 hours after the bolus. Alarm must be raised."

Quite a few years ago, meetings of all the anaesthesiologists (or their representatives) from Johannesburg and Pretoria were held at Kloppenheim to discuss this very problem. Colleagues from both cities came to the same consensus about this problem in South Africa. Monitoring protocols were drawn up and protocols to deal with various situations that may arise with indwelling epidural catheters in the nursing scene. The idea was that these would be distributed to colleagues and hospitals in an attempt to standardise the monitoring.

This did not happen, but these protocols are included below in appendix 1 and 2. It is important to note that these are not the opinion of the author as an individual, or of SAJRA as a journal, but a group effort and consensus of all the colleagues at the time. In view of that fact, if you feel that these protocols could be useful to you in your practice, feel free to copy them and use them in your practice and in your hospital as much as you like.

Unfortunately they do not include protocols for dealing with indwelling catheters in patients on Arixtra[®] (fondaparinux) as it was not available in South Africa at the time. Also, at present not a lot of work has been done on Arixtra[®] (fondaparinux) and indwelling catheters. For that reason we have included a reprint of a French article on the subject. Bear in mind that the French historically have always been so conservative in their approach to this matter, that is borders on impractical for the South African setting with its time and financial constraints.

5. OUTCOMES

It is distressing to note that while recovery may or can be good, how often it is partial, poor or non-existent.

Greater neurological recovery occurs as the interval from symptom to surgery decreases (8-12 hours)

Factors which are possibly associated with poor outcomes after an epidural haematoma include:

1. If the haematoma involves multiple spine levels
2. Haematoma in the thoracic region
3. Severity of compression
4. Speed of fallout development
5. Level of fallout.
6. Delayed surgical decompression

Why would surgery be delayed?

1. Unsure / difficult diagnosis. Performing MRI – should be done as emergency
2. Abysmal lack of training and monitoring by staff and their underestimation of the importance of this complication
3. Lack of communication between the staff and doctors and between colleagues
4. Time frame underestimation - time passed a lot quicker than one thinks in situations like this.

6. TREATMENT

For post epidural anaesthetic haematoma the treatment is always surgical decompression. Conservative treatment should ONLY be considered in spontaneous haematomas and only if there is minimal fallout and recovery has already started.

The anaesthesiologist should bring these facts to the attention of the neurosurgeon.

It is very interesting to note, however, that the treatment of post dural puncture headache is an iatrogenic, huge, epidural haematoma – up to 20 ml of blood. The average post anaesthetic haematoma is 2 – 5 ml of blood. Why is this huge haematoma symptom free and such a small one so devastating. There must be another factor involved. One of the possible causes for the symptoms mentioned above is 'lysis of blood cells'. When performing blood patch for dural puncture we know that patients can become quite toxic from the lysis of blood cells, but they do not become paralysed from it. The only other factor that could be involved is - spinal stenosis.

It is probable that, performing neuraxial anaesthesia, we cause a lot more epidural haematomas than we think (especially with bloody taps), but in patients with normal spines there is space to accommodate the haematoma and it is, therefore, asymptomatic – like the blood patch. It is in patients with spinal stenosis that there is no space to accommodate the blood, resulting in pressure on the cord and nerves. On average it is the older patient that has spinal stenosis and they present for orthopaedic surgery so in these patients one must be especially vigilant for this devastating complication. This would also explain why haematomas in the thoracic region have worse outcomes – the thoracic region is the area of physiological stenosis – the canal is narrowest in the lower thoracic segments.

Although the incidence of epidural haematomas in the spinal canal appears to be low it is a very devastating complication. As we begin to use Arixtra[®] (fondaparinux) we must be especially vigilant for this complication, and should review our monitoring protocols. As it is a new drug, we have little experience with it and we do not want to be caught out by it.