

# Epidural Haematoma- An Audit of time interval from onset of neurology to operative intervention

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## Introduction:

- Spinal/Epidural haematoma- Infrequently described complication of Neuroaxial Anaesthesia
- Incidence of haematoma in patients with no added morbidity:
  - ◆ Epidural Anaesthesia: <1 in 150,000
  - ◆ Spinal anaesthesia: <1 in 2,20,000
- More common in patients on anticoagulants, thrombocytopenia, or with alcoholic liver disease
- Delayed diagnosis of cord Ischaemia secondary to injected LA seen as a cause of postop weakness and numbness
- Clinical symptoms are back pain (radicular), bladder dysfunction and sensory/motor deficits
- Posterior spinal columns- first to be affected: Impaired vibration, two point discrimination, and position sense are the first clinical findings
- Anterolateral spinothalamic tract- last structure to be affected so pain, temperature and light touch are the last clinical findings
- The most important factors for neurological recovery:
  - ◆ Preoperative neurological deficit and operative interval
- Neurological outcome: Related to the time between clinical symptoms and surgical decompression
- Immediate surgical decompression is the best way to achieve neurological restitution
- For a full neurologic recovery the time interval between the onset of paralysis and surgery should not be more than 8 hours
- Cardinal feature of spinal haematoma: A delay in return of sensory or motor function after spinal or epidural block until proven otherwise

## Bromage Scale:

Grade	Criteria	Degree of block
1	Free movement of legs and feet	Nil (0%)
2	Just able to flex knees, free movement of feet	Partial (33%)
3	Unable to flex knees free movement of feet	Almost complete(66%)
4	Unable to move legs or feet	Complete (100%)

## Protocol:

- Stop epidural infusion if significant leg weakness with score of 3 or 4
- Reassess leg strength every 30 minutes
- If better, recommence epidural at a lower rate
- If no better and >4 hours since epi stopped- exclude haematoma
  - ◆ DW senior Anaesthetist
  - ◆ DW neuroradiology re urgent MRI
  - ◆ Inform neurosurgical team
  - ◆ Evacuation of Haematoma < 8 hours from onset of symptoms for
  - ◆ best recovery

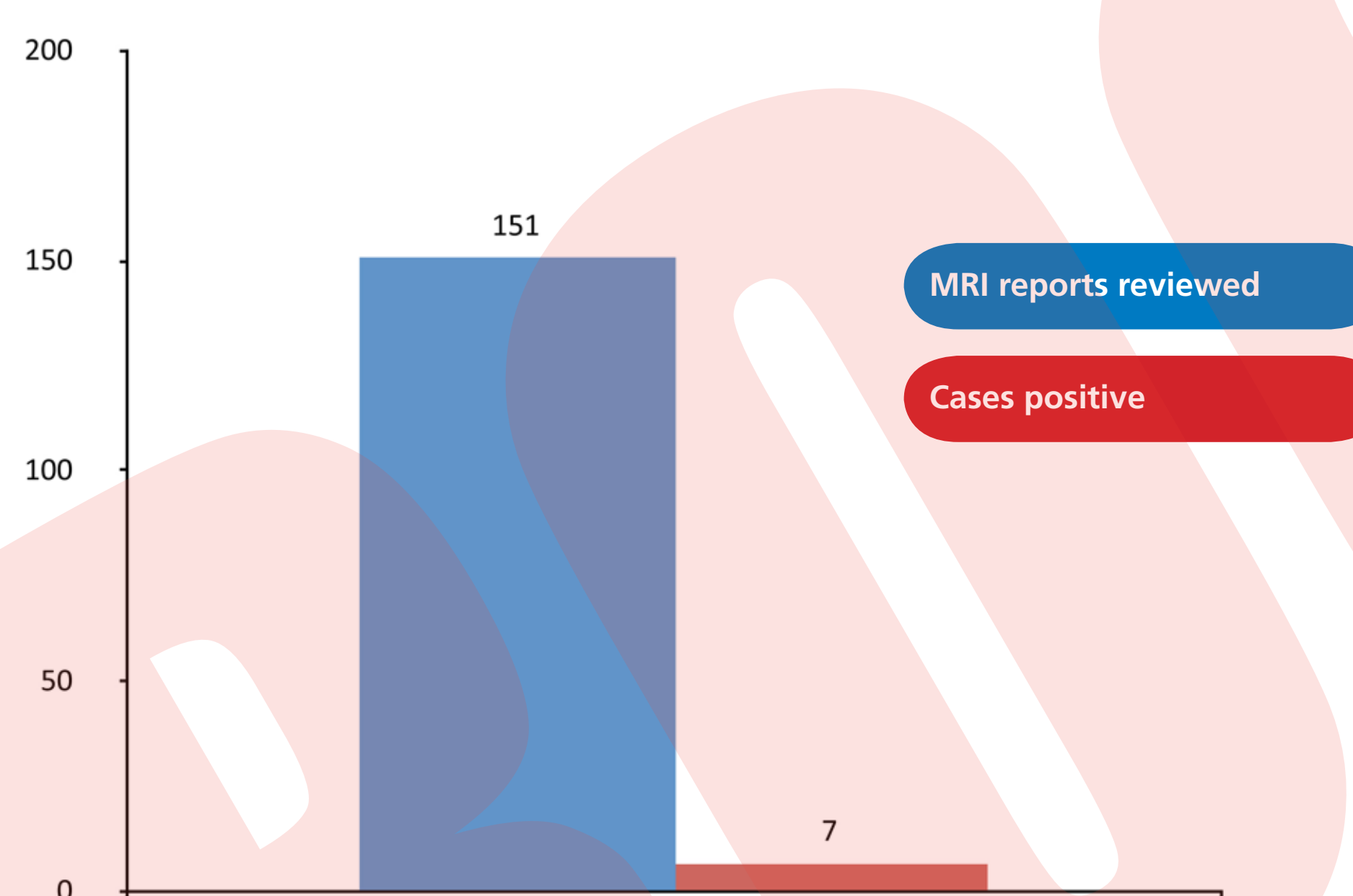
## Standard:

- 100% patients with a confirmed diagnosis of epidural haematoma on MRI scan were operated upon if indicated, within 8 hours from the onset of neurology

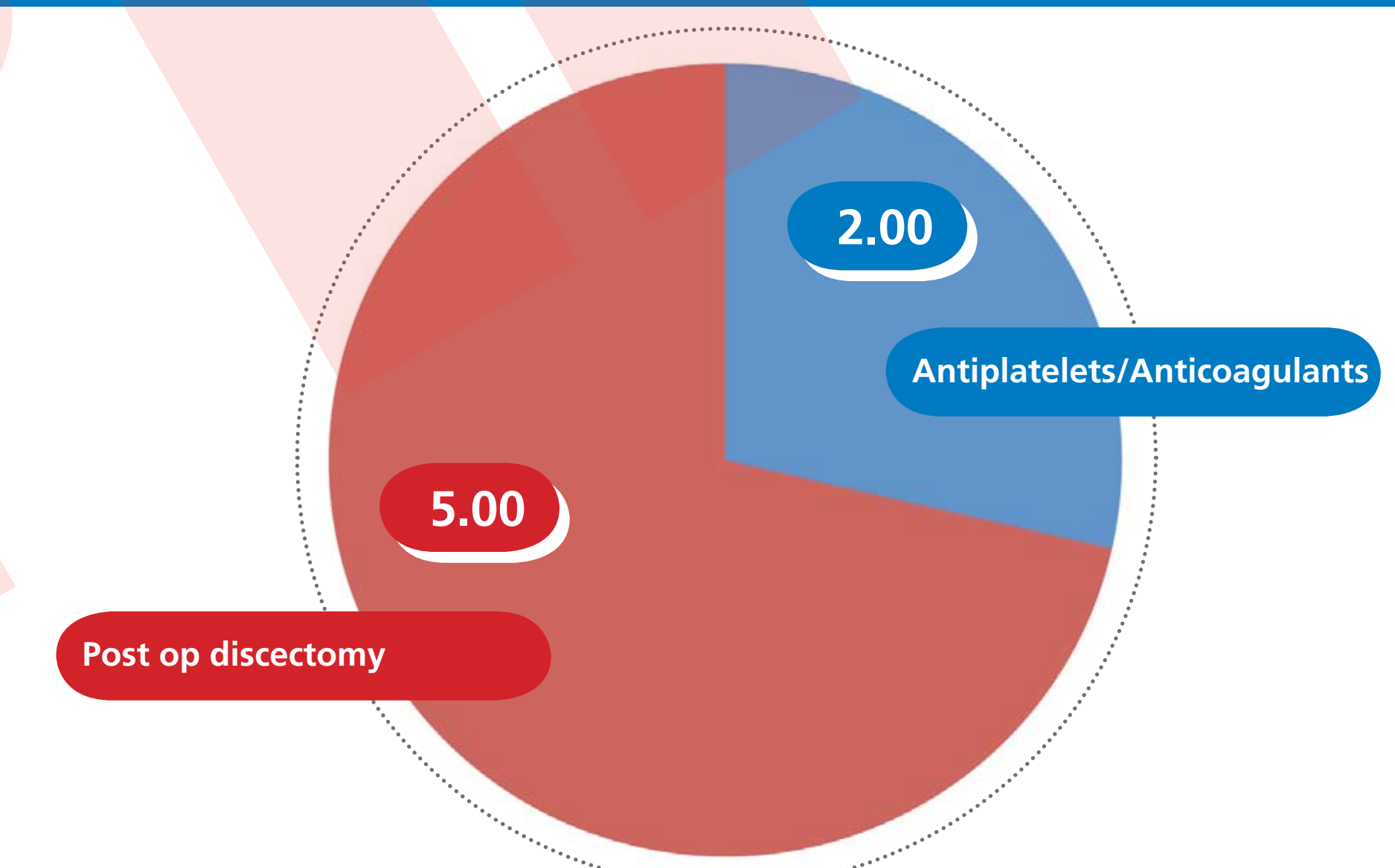
## Methods:

- Help from Neuroradiology manager and quality lead for clinical diagnostics and support services
- Time period: 01/03/2014 to 01/04/2015
- Search for keyword " Haematoma" in the report
- 151 MRI reports identified
- All MRI reports of cervical spine (with/without contrast), Cervicothoracic Spine, (with/without contrast), thoracic spine (with/without contrast), thoracolumbar spine (with/without contrast), lumbar spine (with/without contrast), whole spine (with/without contrast) reviewed

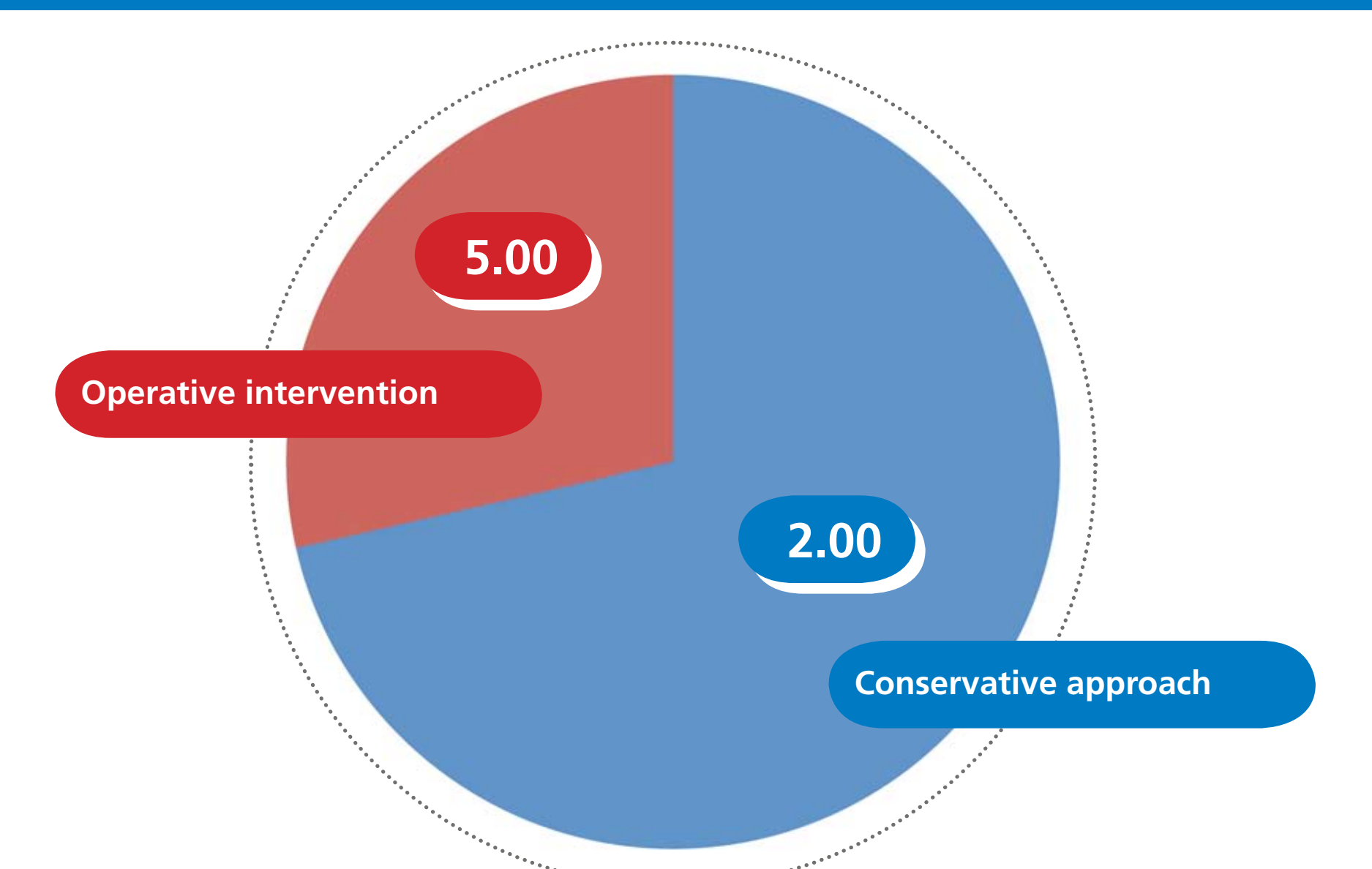
## Analysis:



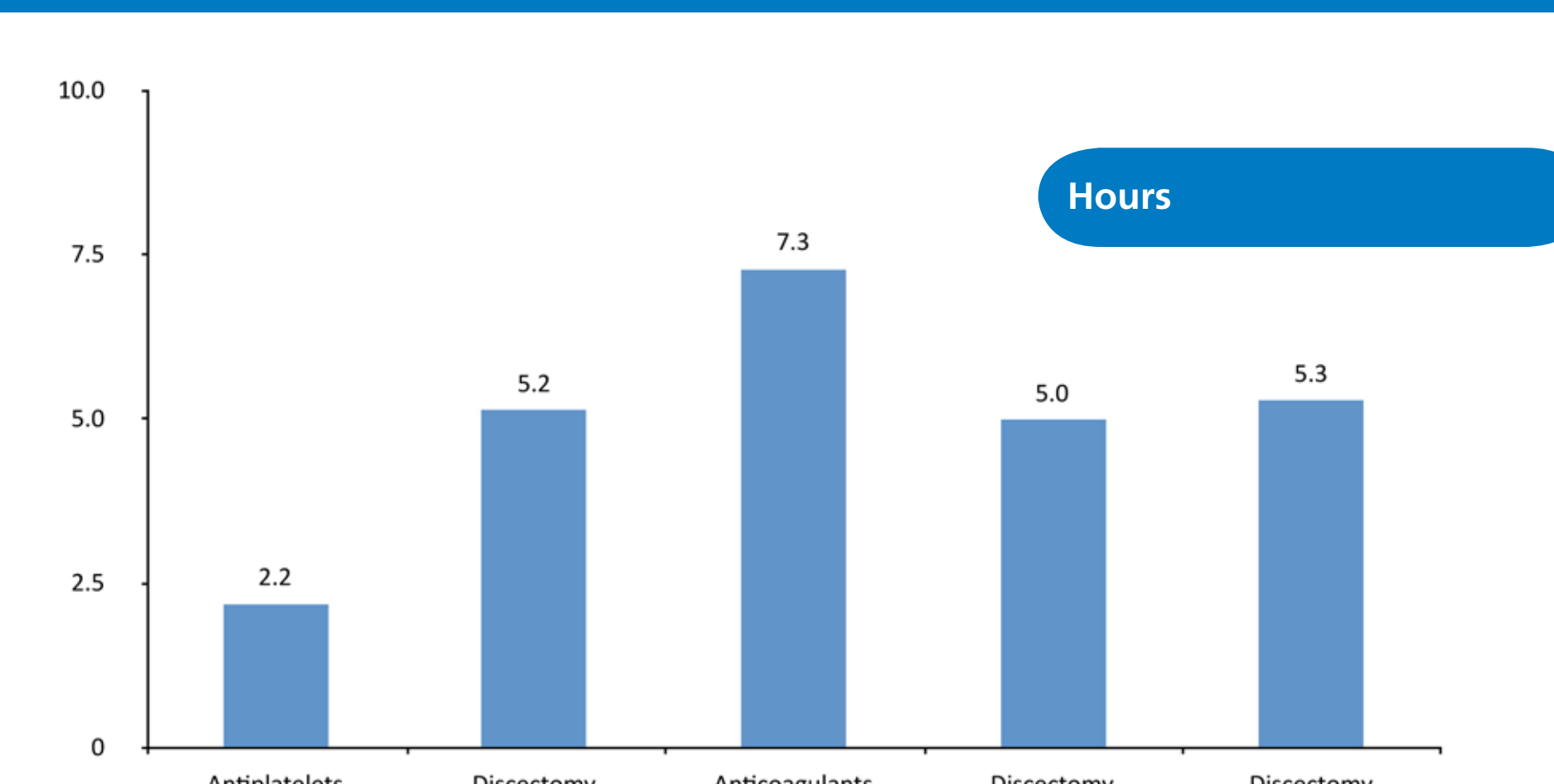
## Reason for urgent MRI:



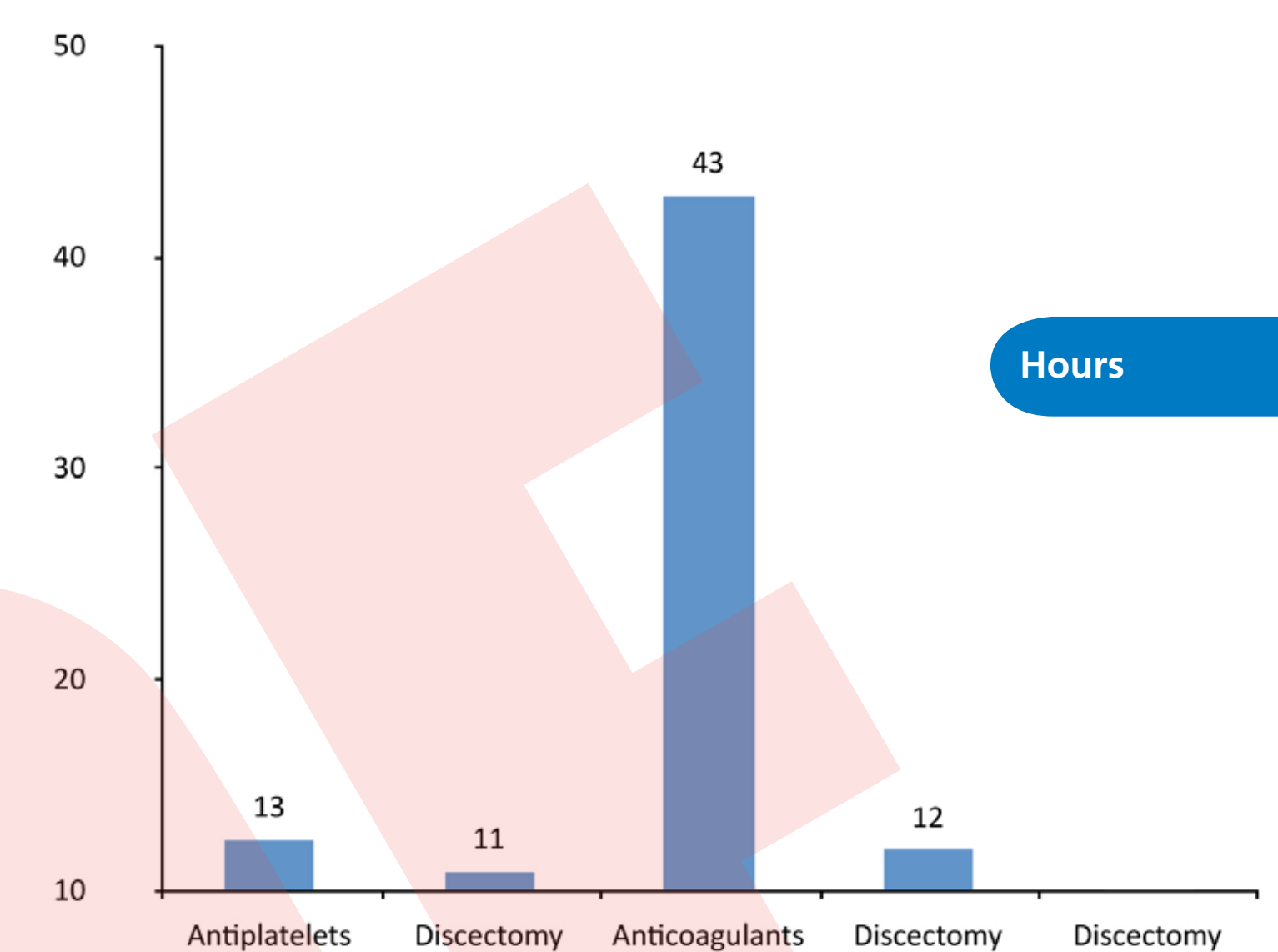
## Of the 7 positive:



## Time from scan to theatre:



## Time from onset of neurology to Theatre



## Discussion:

- Commonly cited reasons for delay:
  - ◆ Organisational deficiencies-delay in diagnosis and intervention
  - ◆ Inadequate monitoring
  - ◆ Poor understanding of abnormal findings
  - ◆ Poor interdepartmental referral processes
  - ◆ Equipment issues-unavailable out of hours or broken
  - ◆ Lack of availability of beds in tertiary referral centres for patients requiring specialised emergency surgery

## Recommendations:

- Maintain high index of suspicion
- Adequate monitoring to detect early neurological dysfunction
- Physical examination
- Urgent radiological exam
- Emergency neurosurgical evaluation for urgent decompression

## Evidence:

- Anthony M et al: Timing of Surgical Intervention in Cauda Equina Syndrome: A Systematic Critical Review, worldneurosurgery.org, 2013
  - ◆ Earlier the surgical intervention, the more beneficial the effects for compressed nerves, especially with acute neurological compromise
  - ◆ Level of neurological dysfunction at surgery is probably the most significant determinant of prognosis.
  - ◆ Onset and duration of symptoms likely to have an impact, on duration of neurological recovery
- Liao CC et al: Experience in the surgical management of Spontaneous spinal epidural Haematoma, J Neurosurg.2004 Jan;100(1 Suppl Spine):38-45
  - ◆ Neurological outcome after surgery is positively correlated with preoperative neurological deficits
  - ◆ 88.9% complete recovery in patients with incomplete neurological deficits compared with 37.5% in those with complete deficits. p < 0.001
  - ◆ Better neurological and functional recovery In patients with shorter time interval from initial presentation was shorter (< 48 hours) and in whom the duration of complete neurological symptoms was also briefer (< 12 hours) p < 0.05

References: Cook et al: Major complications of CNB, NAP 3 Audit, RCOA, 2008, Erbay R.H et al: Spinal or epidural Haematoma

Anthony M et al: Timing of Surgical Intervention in Cauda Equina Syndrome: A Systematic Critical Review, worldneurosurgery.org, 2013

Hiroyuki et al: Incidence of postoperative symptomatic epidural hematoma in spinal decompression surgery, J Neurosurg Spine 5:202-205, 2011

Liao CC et al: Experience in the surgical management of Spontaneous spinal epidural Haematoma, J Neurosurg.2004 Jan;100(1 Suppl Spine):38-45.