ARACHNOIDITIS:
Taming the Painful Shrew

Forest Tennant MD, DrPH

DISCLOSURES

- EDITOR: PRACTICAL PAIN MANAGEMENT
- SPEAKER: REGENESIS BIOMEDICAL
LEARNING OBJECTIVES

- Explain the difference between arachnoiditis and adhesive arachnoiditis
- Identify which lumbar and cervical pain patients have arachnoiditis
- Explain the major causes of arachnoiditis
- Cite the clinical course and pathologic complications

DEFINITION OF ARACHNOIDITIS

- INFLAMMATION OF THE ARACHNOID LAYER (middle) OF THE SPINAL CANAL (theca) or BRAIN (meninges).
DEFINITION OF ADHESIVE ARACHNOIDITIS

- The presence of adhesions between some cauda equina nerve roots and the arachnoid lining.

THE CAUDA EQUINA (“HORSES TAIL”)

The precursor or initiator of arachnoiditis is inflammation in the nerves in the cauda equina or arachnoid layer.
CAUDA EQUINA (Nerve Roots) IS BELOW L-1

CAUDA EQUINA IN SPINAL CANAL
CAUSES

- Friction
- Compression
- Trauma
- Toxin
- Infection

Initiating injury can be to cauda equina nerve roots or arachnoid lining.

COMMON SPINAL CONDITIONS INITIATE THE NEUROINFLAMMATORY PROCESS

- Arthritis
- Spinal Stenosis
- Osteoporosis
- Herniated Discs
- Kyphoscoliosis
- Tarlov Cysts

Medical/surgical procedures may accelerate the process.
NEUROINFLAMMATORY PROCESS

INITIATING INJURY

NERVE ROOT

INFLAMMATION

ARACHNOID LINING

INFLAMMATION

ADHESIONS

SEVERE PAIN AND IMPAIRMENT

NEUROINFLAMMATORY DISORDERS OF THE LOWER SPINE

- CHRONIC CAUDA EQUINA SYNDROME (CCES)- Inflammation of Nerve Roots (ICD 10-G95.9)

- ADHESIVE ARACHNOIDITIS (AA)- Inflammation of Lining with Adhesions (ICD 10-G03.9)
COMMON GENETIC BASIS

- EHLERS-DANLOS SYNDROME
- MARFAN’S SYNDROME
- TARLOV CYSTS
- KYPHOSCOLIOSIS
- RHEUMATOID SPONDYLITIS

EHLERS-DANLOS-CHIARI MALFORMATION ARACHNOIDITIS
MARFAN’S AND ARACHNOIDITIS

NO LONGER RARE OR HOPELESS

TB
CAUSES
SYPHILIS
IN PAST
PANTOPAGUE DYE

OUT DATED CONCEPTS: failed back, low back, degenerative spine – can’t treat
SEQUELAE OF ADHESIVE ARACHNOIDITIS

- CONSTANT PAIN/CENTRALIZED

- IMPAIRMENT OF NERVE INNERVATION TO:
  - Stomach
  - Intestine
  - Bladder
  - Sex organs
  - Lower extremity with paraparesis or paralysis

POSSIBLE SEQUELAE

- SPINAL FLUID FLOW OBSTRUCTION
  - Headache
  - Blurred vision
  - Tinnitus
  - Mental loss
POSSIBLE SEQUELAE

- SPINAL FLUID LEAKAGE
  - Tissue contraction

- SIT/STAND ABILITY IMPAIRED

- AUTOIMMUNE SYSTEMIC MANIFESTATIONS

POSSIBLE SEQUELAE

- NEUROPATHIC SYMPTOMS
  - Burning feet
  - Allodynia/hyperalgesia
  - Crawling, water dropping, stinging, biting
OVERALL CLINICAL COURSE

- MILD-MODERATE - SEVERE and CATASTROPHIC
- PROGRESSION – Eternal Fear
- SUBMISSION AND RELAPSES
- CAN RESOLVE
- SEVERE COMPLICATIONS: Paralysis, Dementia, Adrenal Failure, Sepsis, Death

PHYSICAL EXAM - LUMBAR

- LOWER EXTREMITY DEFECTS – weakness, hyporeflexia, decreased ROM
- UPPER EXTREMITY - ↓ ROM
- CAN’T STAY IN ONE POSITION LONG – sit, stand, recline
- BACK – indentation: contractures, asymmetry
- SKIN – cold, heating pad burns
CERVICAL NECK PHYSICAL FINDINGS

- Pain on forward flexing or backward tilting/extension depending on location of inflamed lining
LABORATORY TESTING

### ELEVATED INFLAMMATORY MARKERS
- CRP-HS
- ESR
- Interleukins
- Tumor necrosis factor
- Myeloperoxidase
- Alpha-1-antitrypsin

### HORMONE ABNORMALITIES
- Pregnenolone
- DHEA
- Cortisol
- Progesterone
- Estradiol
- Testosterone

DIAGNOSTIC CONFIRMATION IS BY AN MRI WITH CONTRAST
NORMAL AXIAL VIEW ON MRI

STOMACH

VERTEBRAE

NERVE ROOTS

ARACHNOID LINING

SPINAL PROCESS

BACK

SPINAL FLUID

L2-L3
L 1 – L 3
L 5 – S 1

NORMAL
L-1 – L2
46 Y/O Male Post Lumbar Fusion
With Constant Disabling Pain And
Partially Paralyzed Left Leg
Patient with constant pain, neurogenic bladder, allodynia, and weak legs. Nerve roots are displaced, enlarged, and show clumping and adhesions.
EMPTY SAC APPEARANCE

- 39 Y/O Female With Constant Crippling Back, Leg, And Foot Pain
SHOWS SPINAL FLUID FLOW OBSTRUCTION

MULTIPLE OBSTRUCTIONS
EMPTY SAC APPEARANCE

MULTIPLE OBSTRUCTIONS AND BACK INDENTATION
PARAPARESIS

Severe clumping of nerve roots.

Shows adhesions to arachnoid lining.

ELEVATED CRP-HS, ESR, CORTISOL

Shows spinal fluid obstruction and leakage.
ANTERIOR MINIMAL SPINAL FLUID FLOW AND THICKENED LINING

LOW CORTISOL, PREGNENOLONE, HIGH ESR

Anterior spinal fluid not visible.
POST SURGERY CERVICAL FAT PAD
LITTLE SPINAL FLUID FLOW

4 COMPONENTS OF TREATMENT
SCREENING FOR ADHESIVE ARACHNOIDITIS

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
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<tbody>
<tr>
<td>1</td>
<td>Do you have constant back pain?</td>
<td></td>
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<tr>
<td>2</td>
<td>Do you have difficulty starting or stopping urination?</td>
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<tr>
<td>3</td>
<td>Do you have burning on the bottom of your feet?</td>
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<td>4</td>
<td>Do you have blurred vision or ringing in your ears?</td>
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<tr>
<td>5</td>
<td>Do you have to stand after you have sat for 10 minutes?</td>
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If you answer yes to 4 of the 5, you very likely have adhesive arachnoiditis.

SUMMARY

- MRI & laboratory technology has advanced the understanding of arachnoiditis
- No longer a “RARE” disease
- Should cast aside vague, non-descript terms (i.e. low back, failed, degenerative)
- Arachnoiditis may resolve but may be progressive and catastrophic
- Pain relief and treatment of neuroinflammation are essential
References


References