WHAT EVERYONE WORKING WITH BACK PAIN NEEDS TO KNOW ABOUT CAUDA EQUINA SYNDROME

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&

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THE CHALLENGES OF CES

- Definition
- Early diagnosis
- Assessment
- Medico-legal
- Research trials
LIFE CHANGING CONSEQUENCES

• 1/5 patients will have poor outcome;
• on-going treatment for sexual dysfunction
• self catheterisation
• colostomy
• psycho-social/psycho-sexual issues
• Rarely return to same job/work
• Post –operative complications management
• Dissatisfaction with care: ‘I felt very abandoned’, captured experiences of feeling neglected and disbelieved by the healthcare system and a wish for symptoms to be validated.

• Hidden to others: ‘Nobody knows. It’s horrible’, spoke to a struggle to gain a social identity in relation to a hidden disability.

• Changing identities: ‘You become someone totally different’ versus ‘You’re still the same person’, captured a process of renegotiating identity following CES.
VULNERABLE ANATOMY;
A SURGICAL EMERGENCY

CE provides innervation to lower limbs, sphincters, sensory innervation to saddle and parasympathetic innervation to bladder and distal bowel.
5 CHARACTERISTIC FEATURES

• Bilateral neurogenic sciatica
• Reduced perianal sensation
• Altered bladder function
• Loss of anal tone
• Sexual dysfunction
CLINICAL DIAGNOSIS

• No broadly accepted definitive diagnostic criteria; 17 different definitions of CES (Fraser et al, 2009)

• Signs and symptoms can be subtle and vague, varying in intensity and evolution (Bin et al, 2009)
Definitions: Fraser

- 100% unanimity
- 75-99% consensus
- 51-74% majority
- 0-50% no consensus

- No unanimity or consensus in 105 papers
- Majority view: bladder and sensory disturbance (74% 66%)
A patient presenting with acute back pain and/or leg pain with a suggestion of a disturbance of their bladder or bowel function and/or saddle sensory disturbance should be suspected of having or developing a cauda equina syndrome.

...in the absence of reliably predictive symptoms and signs, there should be a low threshold for investigation with an EMERGENCY MRI scan. The reasons for not requesting a scan should be clearly documented.

Subjective history key to early diagnosis
NATIONAL PATHWAY OF CARE FOR LOW BACK AND RADICULAR PAIN (2017)

• ‘Emergency referral to secondary care to access urgent investigations and spinal/neuro surgeon opinion same day’
• Diagnosis requires both clinical symptoms and imaging to be concordant

Significantly more patients are referred on for further investigation compared with those having a radiologically confirmed diagnosis of CES (Woods et al, 2015)
(90% negative 10% positive for CES)
81% of patients with CES symptoms did not have CES (Hoeritzauer et al 2020)

BUT 1 in 5 DID have CES
### Cauda Equina Syndrome Groups

*(Todd & Dickson, 2016)*

<table>
<thead>
<tr>
<th>CESS</th>
<th>Bilateral radicular pain (progressing unilateral)</th>
</tr>
</thead>
<tbody>
<tr>
<td>suspected</td>
<td></td>
</tr>
<tr>
<td>CESI</td>
<td>Urinary difficulties of neurogenic origin, altered urinary sensation, loss of desire to void, poor urinary stream, need to strain to micturate</td>
</tr>
<tr>
<td>incomplete</td>
<td></td>
</tr>
<tr>
<td>CESR</td>
<td>Painless urinary retention and overflow incontinence</td>
</tr>
<tr>
<td>retention</td>
<td></td>
</tr>
<tr>
<td>CESC</td>
<td>Loss of all CE function, absent perineal sensation, patulous anus, paralysed insensate bladder and bowel</td>
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<tr>
<td>complete</td>
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</table>
All felt patients are at risk of harm if presenting with bilateral sciatica. Rapid access to urgent same-day MRI is needed to add to the existing standard of that where traditional “red flags” are present.
A Disconnect with Connect Health: A Reasoned View of Bilateral Leg Pain and Cauda Equina Syndrome

05/03/2019
• Unilateral back pain progressing to bilateral leg pain is a concerning presentation.

• In isolation bilateral leg pain is not necessarily a red flag for suspecting Cauda Equina Syndrome.

• Patients with bilateral leg pain should always be safety-netted

• Patients with urinary or bowel disturbance >4/52 not likely to need emergency MRI scan
<table>
<thead>
<tr>
<th>Bilateral leg pain with any CES symptoms</th>
<th>Emergency referral: Patient needs MRI as soon as possible. Follow local pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilateral leg pain with abnormal neurology but no CES symptoms</td>
<td>Urgent Referral: Management depends on degree of deficit. If motor loss &lt; 3/5 or deteriorating, MRI within 1 week. Follow local pathway and safety net patient for CES</td>
</tr>
<tr>
<td>Bilateral leg pain with normal neurology, positive neurodynamic tests but no CES symptoms</td>
<td>Treat as per radicular pain pathway. Routine MRI if symptoms sufficiently troublesome. Safety net patient</td>
</tr>
<tr>
<td>Bilateral leg pain with normal neurology, normal neurodynamic tests and no CES symptoms</td>
<td>Treat as per radicular pain pathway. Safety net patient</td>
</tr>
</tbody>
</table>
ASSESSMENT

• Most information gained in the subjective

• Physical tests have limited validity and reliability
57 patients in one year in Derby, 13 positive on MR
DRE did not predict CES on MR
odds ratio 1.43 p= 0.89 diagnostic accuracy 51%

No combination of factors (UP TO 8) combined to predict the presence of CES on MR
SADDLE SENSATION; LIGHT TOUCH AND PIN PRICK?

Sensitivity of the following tests is relatively poor;

- Perianal sensation
  - Altered urinary and perineal sensation
  - Loss or diminution of the bulbocavernosus reflex (Bell et al, 2007; Fairbank et al, 2011 Delitto et al 2012).

Peri-anal sensation not different between groups with and without radiologically confirmed CES. Subjective report helpful (Angus et al, 2018).
RESIDUAL BLADDER VOLUME

- 500ml retention correlates with +ve MRI in CES (bilat sciatica, retention)

- >400ml pre void - >200ml post void
BLADDER POST VOID U/S RESIDUAL VOLUME SCAN?

- Venkatesan BASS Spine 17, 3, S7 2017 92 pts over 6 months
- 18% positive CES; emergency surgery
- 60% perineal PP sensory loss
- 40% reduced anal tone
- >400mls pre void >200mls post void
- 87% sensitivity (61-98)
- 76% specificity (65-85)
- Odds ratio 20.7
Clinically predictive factors

• Perineal/sacral sensory impairment

• Urological dysfunction

  Qureshi and Sell: Eur Spine J 2007 16(12) 2143-2151
  Balasubramaninan et al: Br J Neurosurg 2010, 24 (4) 383-386 p 0.03
  Jalloh and Minhas: Emerg Med J 2007 24(1) 33-34
  McCarthy et al Spine 2007 32:2; 207-216
  Bladder post void volume >200mls Venkatesan 2017 BASS
Is urinary retention a predictive factor in outcome?

- Better outcome in the continent
  Qureshi and Sell  Eur Spine J 2007 16(12); 2143-2151
  Back and leg pain, QOL, urinary symptoms p<0.05

- No difference in outcome with urinary retention at presentation
  McCarthyMJH et al  Spine 2007 32: 2;207-216
PREDICTORS OF OUTCOME

• Konig et al 2017 Eur Spine Journal
• Retrospective study 2001-2010
• Perineal and perianal sensory loss strongly associated with very poor outcome
• Decreased anal tone associated with poor outcome
• Surgery <24 hours leads to better urinary outcomes
# Medication Masqueraders

<table>
<thead>
<tr>
<th>Class</th>
<th>Examples</th>
<th>Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opioid Salts</td>
<td>Tramadol, Codeine,</td>
<td>Constipation, reduced gastric motility, reduced bladder sensation</td>
</tr>
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<tr>
<td>Anticonvulsants</td>
<td>Gabapentin, Pregabalin</td>
<td>Urinary incontinence</td>
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<tr>
<td>Antidepressants</td>
<td>Amitriptyline, Nortriptyline</td>
<td>Retention, sexual dysfunction, reduced awareness of need to pass urine</td>
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<tr>
<td>NSAIDS</td>
<td>Naproxen, Ibuprofen</td>
<td>Retention twice as likely in men than women</td>
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</tbody>
</table>
### CONFOUNDERs

<table>
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<tr>
<th>Medication</th>
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<tbody>
<tr>
<td>• Opioids</td>
</tr>
<tr>
<td>• NSAIDs</td>
</tr>
<tr>
<td>• Neuropathic pain meds</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Other pathologies</th>
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</thead>
<tbody>
<tr>
<td>• Prostate, SUI, Infection</td>
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<tr>
<td>• MS, Prolapse, fibroids</td>
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<table>
<thead>
<tr>
<th>Sensory changes</th>
</tr>
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<tbody>
<tr>
<td>• Trauma, Parkinson’s</td>
</tr>
<tr>
<td>• Cord compression, Guillain Barre</td>
</tr>
<tr>
<td>Cauda Equina Syndrome Masqueraders</td>
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<tr>
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<tr>
<td><strong>Urinary Tract Infection</strong></td>
</tr>
<tr>
<td>Gabapentin</td>
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<tr>
<td>Prostate cancer</td>
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<tr>
<td>Cocodamol</td>
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<tr>
<td>Pudendal nerve</td>
</tr>
<tr>
<td>Prolapse</td>
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<tr>
<td>Pain inhibition</td>
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<tr>
<td>Anxiety</td>
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<tr>
<td>Diabetes</td>
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<tr>
<td>Parkinson's</td>
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<tr>
<td><strong>Polio</strong></td>
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<tr>
<td>Neuropathy</td>
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<tr>
<td>Pernicious anaemia</td>
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<tr>
<td>Balanitis</td>
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<tr>
<td>Urethral stricture</td>
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<tr>
<td>Multiple Sclerosis</td>
</tr>
<tr>
<td>Lyme disease</td>
</tr>
<tr>
<td>Constipation</td>
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<tr>
<td>Bladder calculi</td>
</tr>
<tr>
<td>Retro-peritoneal malignancy</td>
</tr>
<tr>
<td><strong>Guillain-Barre</strong></td>
</tr>
<tr>
<td>Fibroid</td>
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<tr>
<td>Pelvic mass</td>
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<tr>
<td>Transverse myelitis</td>
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<tr>
<td>Ovarian cyst</td>
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<tr>
<td>Amphetamines</td>
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<tr>
<td>Tramadol</td>
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<tr>
<td>Herpes zoster</td>
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<tr>
<td>Cholinergic medication</td>
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<tr>
<td>Anti-cholinergic medication</td>
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<tr>
<td><strong>Tabes dorsalis</strong></td>
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<tr>
<td>NSAIDS</td>
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<tr>
<td>Diverticulitis</td>
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<tr>
<td>Renal calculus</td>
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<tr>
<td>Benign Prostate hypertrophy</td>
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<tr>
<td>Pelvic fracture</td>
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<tr>
<td>Post partum trauma</td>
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<tr>
<td>Ischaemia</td>
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<tr>
<td>Peripheral Vascular Disease</td>
</tr>
<tr>
<td>Retroverted uterus</td>
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<tr>
<td><strong>Decongestant medication</strong></td>
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<tr>
<td>Central sensitisation</td>
</tr>
<tr>
<td>Bilharziasis</td>
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<tr>
<td>Cabladder</td>
</tr>
<tr>
<td>Vulvo-vaginitis</td>
</tr>
<tr>
<td>Psychogenic</td>
</tr>
<tr>
<td>Intra-Pelvic adhesions</td>
</tr>
<tr>
<td>Alcoholism</td>
</tr>
<tr>
<td>Smoking</td>
</tr>
<tr>
<td>Rectocele</td>
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Scale of the medicolegal problem

- Average for each settlement £250000
- 2005-16 150 MDU cases
- 92% against GPs
- 70% successfully defended
- £350,000 defence costs
- £2250 to 670,000 paid to claimants
- £8 million in compensation
- £4.5 million in legal costs to claimants solicitors
LITIGATION

- MDU 2016 (Taylor)
  - 150 claims from 2005-16
  - 92% against GPs 70% defended
  - 8 million paid out 12% of claims over 500K

- NHSLA 2016
  - 293 claims for CES 2010-15
  - 70% 31-50 y/o
  - 25 million paid out
LITIGATION

- Medical Protection Society (MPS)- 2/5/18
- NICE Clinical Knowledge Summary on CES
- MPS stats 2013-2017
- 105 claims 80% primary care
- Fairbank 2014
  - 30-40 cases per year go to litigation
  - Average compensation 336,000
  - 1000 operations per annum for CES
QURAISHI ET AL (2012) EUROPEAN SPINE JOURNAL

- NHSLA data for all spinal disease 2002-10
- 235 cases-144 trauma/acute
- Missed fractures 41% 75000
- Missed CES 24% 268,000
- Missed infection 12% 433,000
- Cord damage 20% 367,000
GIRFT REPORT ON SPINAL SERVICES
UK FEB 2019

- 29 million spent on CES litigation
- 23% of all legal cases in spinal surgery
- Most referrals to specialist centres made out of hours (73%)
- £334K in 2014- £636K in 2018 average payout
LITIGATION

• Pts say not asked about bladder function
• Challenge clinical notes
• Timing of contacts not recorded
• Fail to examine properly, act on red flags, refer on or investigate with insufficient urgency
• No mention CES considered as differential diagnosis
• Not safety netted when at risk
• Documentation
• Record history and findings, and negative findings
• Examine carefully
• Use information cards
• Refer where clinical suspicion appropriate to existing guidelines; as an emergency if need be
• Follow up on the referral; be clear who is going to act on the result
Safety netting is key

Cauda Equina Syndrome Warning Signs

- Loss of feeling/pins and needles between your inner thighs or genitals
- Numbness in or around your back passage or buttocks
- Altered feeling when using toilet paper to wipe yourself
- Increasing difficulty when you try to urinate
- Increasing difficulty when you try to stop or control your flow of urine
- Loss of sensation when you pass urine
- Leaking urine or recent need to use pads
- Not knowing when your bladder is either full or empty
- Inability to stop a bowel movement or leaking
- Loss of sensation when you pass a bowel motion
- Change in ability to achieve an erection or ejaculate
- Loss of sensation in genitals during sexual intercourse

Any combination or number of these warning signs could be symptoms of Cauda Equina Syndrome.

Seek emergency help immediately

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These CES cards have international transferability across medical professionals to safety net many non-English speaking patients and reduce the catastrophic and life changing effect that CES can have upon an individual.

Free access has been made available on the Dynamic Health and MACP website.

http://www.eoemskservice.nhs.uk/advice-and-leaflets/lower-back/cauda-equina

Gleave and Macfarlane 2002

• Definition: complete (CESR) and incomplete (CESI)
• Outcome: subjective, and time dependant

• 4 studies show no benefit from early surgery (Jennett 14, Kostuik 31, Gleave 33, Stephenson 45)
• 3 studies (Shapiro 44, Kennedy 19, and Ahn 332) showed benefit of early surgery (48 hours)
• Literature demonstrates no benefit from early surgery for CESR
A QUALITATIVE INVESTIGATION INTO PATIENTS EXPERIENCE OF CAUDA EQUINA SYNDROME

PHYSIOTHERAPY RESEARCH FOUNDATION (PRF) GRANT

Exploring patient experience of signs and symptoms associated with CES including changes in bladder, bowel and sexual function

- what symptoms patients actually suffer
- patients own reasoning of these symptoms
- the patient experience of divulging this information
7 THEMES EMERGED “JANENE’S STORY”

- Catastrophic Pain
- Impact on Life
- Common Symptoms / Varying Chronology
- Sense of change / Seriousness
- Contact with Health Professionals
- Carers Experience
- Suggestions to aid early diagnosis
SHADES of grey – The challenge of ‘grumbling’ cauda equina symptoms in older adults with lumbar spinal stenosis

Christine Comer1,2, Laura Finnane3, Chris Mercer4, Susan Greenhalgh5

1Cumbria Community Healthcare NHS Trust, UK
2Cumbria Primary Healthcare, UK
3Waverley Health Partnership, UK
4Cranio-Cervical Fellowship, University of Newcastle upon Tyne, UK
5Theo Foundation Trust, UK

ARTICLE INFO
Keywords: lumbar spinal stenosis

ABSTRACT
Diagnosing cauda equina syndrome is challenging in older adults with lumbar spinal stenosis. These challenges are crucial for clinicians who are faced with difficult decisions about when to...

Assessment and management of cauda equina syndrome

Sue Greenhalgh1, Laura Finnane3, Chris Mercer4, James Sells6

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2PhD, UOE, UK
3PhD, UOE, UK
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6PhD, UOE, UK

ARTICLE INFO
Keywords: Cauda equina syndrome Red flag Management Safety

ABSTRACT
Introduction: Cauda equina syndrome (CES) is a rare condition that affects the nerves in the spine supplying the bladder, bowel and sexual function. Identification and subsequent urgent action is required to avoid permanent damage to these neural organs. Delay in diagnosis can have devastating and life-changing consequences for patients and result in high cost negligence claims.

Purpose: The purpose of this literature is to examine the current evidence and provide an evidence-based, clinically reasoned approach to the safe management of patients presenting with CES. It will include a focus on the implementation of communication, characterization and a practical approach to either ruling these out or taking appropriate measures for patients and clinicians alike. Clearly, effective diagnosis and management of patients with CES results in a better outcome.
DEC 12TH CONSENSUS STUDY DAY
Quantifying the clinical aspects of the cauda equina syndrome – The Cauda Scale (TCS)

Nicholas V. Todd

Pages 260-263 | Received 16 Feb 2017, Accepted 13 Feb 2018, Published online: 08 Mar 2018
THE CAUDA SCALE

• Scale based on 3 aspects of examination:
  • Bladder
  • Sensation
  • Anal tone
• Scored out of 9- 3 for each. 9 normal
UNDERSTANDING CAUDA EQUINA SYNDROME STUDY

• Prospective observational cohort study
• Identification during emergency admission
• Trainee data collection to describe clinical presentation, investigation & treatment
• Outcome measures by email questionnaire at 6 and 12 months
Patients suspected of CES should undergo an emergency MRI by the receiving hospital prior to referral to spinal unit.

BUT

• > 50% referred without imaging
• 63% of referrals were made out of hours
• 16% underwent decompression
ENTICE FINDINGS

• Most patients were referred out-of-hours and many were transferred for an MRI without subsequently requiring surgery. Adherence to guidelines would reduce the number of referrals to spinal services by 72% and reduce the number of patient transfers by 79%

BUT

• Those scanned prior to referral experienced longer delays from MRI to decompression
An evidence informed clinical reasoning framework for clinicians in the face of serious pathology in the spine

Finucane, Selfe, Mercer, Greenhalgh, Downie, Pool, Boissonault, Beniuck, Leech

Phase 1 - Systematic reviews
CES, malignancy, #, Infection

Phase 2 - Consensus stage

Phase 3 - Drafting of framework

Phase 4 - Expert Review

Phase 5 - Framework Development
THANKYOU

www.csp.org.uk/ces