

Case report

Aseptic Meningitis with Acute Urinary Retention

ABSTRACT:

AIM: To know the clinical importance of acute urinary retention in aseptic meningitis.

CASE PRESENTATION: Reporting a case of a 19-year-old male, presented with signs and symptoms of meningitis and later developed urinary retention. CSF analysis was consistent with aseptic meningitis. MRI brain and CSF meningoencephalitis panel was normal. Urinary retention in the context of meningitis is known as Meningitis retention syndrome (MRS). MRS is rare but it is an important complication in meningitis. Early treatment with antiviral therapy was associated with favorable outcome in our patient.

DISCUSSION: Aseptic meningitis is an inflammation of the meninges caused by agents including viruses, non-viral pathogens, non-infectious conditions and chemicals. Meningitis-retention syndrome (MRS) is a peculiar combination of aseptic meningitis (AM) and acute urinary retention without other neurological symptoms which is often self-limiting.

CONCLUSION: Our case demonstrates the importance of recognizing MRS as a unique neuro-uological condition and a rare complication which is oftenself-limiting. The awareness of MRS and its clinical course by both neurologists and urologists may help prevent unnecessary

Comment [BAR1]: Abstract should not contain "Discussion" section. Discussion is present in the main manuscript.

32 investigation and treatment and can reduce patients' anxiety.

33

34

35 INTRODUCTION:

36

37 Acute urinary retention, usually considered as a urological emergency.

38 Urinary retention is common in elderly men, and it is usually attributed

39 to prostate hypertrophy. However, urinary retention in childhood, young

40 adults, and in women is very uncommon, and may reflect a neurological

41 disorder [1].

42

43 Urinary retention resulting from a neurological etiology is less common

44 from obstructive causes in men. The causes of neurogenic urinary

45 retention may be divided into three main categories: cortical and

46 subcortical lesions, spinal cord lesions above the conus medullaris, and

47 lesions of the conus medullaris and motor and sensory nerves to the

48 bladder. [2]

49

50 The development of urinary retention in the context of meningitis and

51 CSF pleocytosis without any lumbosacral radiculomyelitis is known as

52 Meningitis Retention Syndrome (MRS) [3]. Presents with fever,

53 headache, stiff neck, and minor pyramidal signs with urinary retention. It

54 is a rare entity and only a few case reports were documented so far.

55

56 In the present study we are reporting such a rare presentation of

57 Aseptic meningitis with acute urinary retention.

58

59

60 CASE PRESENTATION:

61

Comment [BAR2]: These sentences need references.

Comment [BAR3]: This sentence need reference.

Comment [BAR4]: Give references of those few case reports.

Comment [BAR5]: Do not use capital letter in the middle of a sentence.

62 A 19-year-old male is a polytechnic student from Kodungloor, with no
63 known comorbidities was admitted under the department of general
64 medicine in our hospital with high grade intermittent fever with chills
65 for 1 week and severe headache for 4 days. On examination he was
66 febrile with stable vitals. Nervous system examination showed terminal
67 neck rigidity with no other signs of meningeal irritation. Rest of his
68 neurological examination also did not find any other abnormalities.
69 Other systemic examinations were within normal limits. Initial blood
70 investigations were within normal limits. (CRP – 0.20, Leucocyte count:
71 8220) Blood and urine cultures were sent and they showed no growth. In
72 view of severe headache ophthalmology consultation was taken and they
73 opined as bilateral evolving papilledema. Meningitis was considered and
74 MRI Brain with contrast (Image 1) was taken and it showed no
75 meningeal enhancement. On 2nd day of admission, he started
76 complaining of decreased urine output and abdominal pain. Per
77 abdominal examination revealed a full bladder. He also gave a history of
78 urge to pass urine but he had difficulty and he was unable to void urine.
79 In view of painful urinary retention Foley's catheterization was done and
80 post catheterization there was around 1.2 L urine output. In view of
81 urinary retention ultrasound abdomen was done and it was found to be
82 normal. MRI Spine was planned to rule out the causes for urinary
83 retention but withheld due to financial constraints. During stay in the
84 hospital he also has persistent hiccups. Serum electrolytes were sent and
85 they are within normal limits. For which he was started on Prokinetics
86 and muscle relaxants. Lumbar puncture was performed and CSF
87 analysis showed Protein of 159, CSF Glucose 38.8 CSF ADA 2.5 and
88 CSF total cells 315 (90% Mononuclear and 10% segmented cells). CSF
89 cultures were sent and they showed no growth. CSF analysis was
90 suggestive of viral meningitis, and he was treated with Injacyclovir,
91 ceftriaxone and steroids. CSF was sent for the Meningoencephalitis

Comment [BAR6]: Very long sentence. Divide it into small sentences.

Comment [BAR7]: What was the body temperature?

Comment [BAR8]: Explain the vital signs.

Comment [BAR9]: Use the measuring method. e.g. /mm³ etc.

Comment [BAR10]: Had

Comment [BAR11]: Please explain which electrolytes and their result. Only mentioning "within normal limits" is not enough.

Comment [BAR12]: Which drugs and with what dosage?

Comment [BAR13]: 159 what? Mg/dl, mmol/l...

Comment [BAR14]: Explain abbreviations on first use.

Comment [BAR15]: Again. No capital letter in the middle of a sentence.

Comment [BAR16]: Explain the dose of each drug.

92 panel (Table-1) (panel comprises -Epstein-Barr virus, Human
93 cytomegalovirus, Varicella-zoster virus, Enterovirus, Human Parvovirus
94 B19, Adenovirus, Herpes simplex Virus 1, Herpes simplex Virus 2,
95 Human herpesvirus 6, Human herpesvirus7, Parechovirus and Japanese
96 encephalitis virus.

97 Gram positive bacteria: Staphylococcus spp., Staphylococcus aureus,
98 Enterococcus spp., Streptococcus spp, Streptococcus pneumoniae,
99 Streptococcus agalactiae, Listeria monocytogenes. Gram negative
100 bacteria: Pseudomonas aeruginosa, Acinetobacter baumannii,
101 Stenotrophomonas maltophilia, Escherichia coli, Klebsiella pneumoniae,
102 Serratia marcescens, Enterobacteriaceae, Proteus spp., Morganella
103 morganii, Neisseria meningitidis Fungi: Candida spp., C.albicans
104 Resistance markers: mecA, vanA, vanB, blaSHV, blaCTX-M, KPC,
105 SME, NMC-IMI, GES, VIM, GIM, SPM, NDM, SIM, IMP, OXA23,
106 OXA24, OXA48, OXA51, OXA58.) and it was found to be normal.

107 After 10 days, repeat Lumbar puncture was taken and it showed CSF
108 Glucose-63.7 , CSF Protein- 52, CSF Total cells 80(Mononuclear cells)
109 . Prior to discharge foley's catheter was removed and his urine output
110 was monitored for next 48hrs. After removing foley`s catheter he was
111 not having any difficulty in voiding. He was discharged and advised to
112 review in general medicine OPD after 2 weeks. At the time of review, he
113 was completely asymptomatic and he was not having difficulty while
114 voiding.

115
116

117 DISCUSSION:

118 Acute urinary retention referring to the state of not being able to void
119 urine by oneself is caused by bladder outlet obstruction and impaired
120 detrusor muscle contractility and is prevalent in the old and rare in
121 children and adolescents [4] Most common cause of urinary retention is

Comment [BAR17]: You have mentioned names of these viruses and bacteria in Table 1. So, no need to explain all the names here. It is a repetition.

Comment [BAR18]: Which measure was used? mg/dl, mmol etc.

122 usually seen in elderly and it is due to benign prostatic hyperplasia.

123 Urinary retention in Meningitis is a rare entity and which is self-limiting.

124

125 The term aseptic meningitis refers to patients who have clinical and
126 laboratory evidence for meningeal inflammation with negative routine
127 bacterial cultures. The most common causes are the enteroviruses.

128 Additional etiologies include other infections (mycobacteria, fungi,
129 spirochetes), Para meningeal infections, medications, and malignancies
130 [5].

131

132 Here we are reporting a case of acute urinary retention due to
133 Meningitis in a normal healthy individual with no urinary symptoms
134 prior to the onset of disease. Even though Meningitis is a commonly
135 seen neurological disorder, acute urinary retention with meningitis is a
136 rare presentation.

137 Several hypotheses have been put forward to explain the detrusor
138 hypo functioning and urinary retention in MRS, including spinal shock
139 secondary to meningeal irritation, inflammation of tracts of the spinal
140 cord (leading to upper neuron dysfunction), direct viral invasion, or the
141 development of postinfectious acute disseminated encephalomyelitis
142 (ADEM) [6]. In our patient, however, no lesion could be documented
143 after screening the whole brain. MRI SPINE Screening was planned but
144 couldn't be done due to financial constraints. Trial of treatment and its
145 response was tried.

146 Case described in this report has almost the same clinical manifestations
147 as those observed in other literature, patients with MRS. All patients

148 described so far had high fever with meningeal irritation manifesting as
149 headache, stiff neck, and positive Kernig sign, and then developed
150 urinary retention. CSF analysis revealed mononuclear leukocytosis,
151 increased protein levels, and decreased glucose content, therefore,

Comment [BAR19]: Give references.

Comment [BAR20]: Refernces?

152 aseptic meningitis was suggested, MRS was diagnosed.

Comment [BAR21]: Reference??

153 Abhishek Krishna et al case report [3] showed similar clinical
154 presentation, and viral CSF findings with CSF-PCR HSV- 2 positivity.
155 But in the current case, CSF PCR HCV-2 was negative. However, Inj
156 acyclovir was given in both scenarios and the patients were recovered
157 without any intervention.

158 If we compare the current case scenario with F. Ntziora et al case
159 report [7] there was similar presentation but F. Ntziora et al case report
160 showed IgM EBV positive and similarly the patient's urinary retention
161 was recovered after starting acyclovir and no intervention was done.

162 In Gen Ishii Et al case [8], patient CSF herpes simplex (HSV) and
163 herpes zoster viruses (VZV) both were negative but the patient was
164 found to have IgM and IgG HSV titers elevation in the blood. Whereas
165 in Abhishek Krishna et al case CSF-PCR HSV- 2 was positive. Both
166 showed features of MRS and both of them recovered after starting
167 treatment with Acyclovir without any urological complications.

168
169 Abhishek Krishna et al case report [3] showed the patient had symptoms
170 from day 3. CT Scan was taken and it showed a Distended bladder. On
171 day 5 Urodynamic study was undertaken and it revealed an atonic
172 bladder. MRI spine was performed and it didn't reveal any features
173 suggesting myelitis/radiculitis. But it was self-limited and the patient
174 was able to void urine with no difficulty after 2 weeks of disease onset.
175 Whereas in the current case the patient had Urinary retention after 6
176 days and had recovery and was able to void without difficulty after 16
177 days. Akiyuki Hiraga Et al [9] had done a study on meningitis-retention
178 syndrome, 37 Aseptic Meningitis cases were taken, of which 3 patients
179 (8%) were found to have MRS. Study also showed, the mean latency
180 between the onset of meningeal symptoms (headache and/or fever) and
181 the three clinical course milestones (the onset of voiding difficulty,

182 urinary retention and recovery of no residual urine volume) were 8, 9.3
183 and 18 days, respectively. All patients with MRS recovered without a
184 specific treatment, and the mean hospital stay was 18 days. so this can
185 be taken as consideration that MRS Presentation is often seen in Aseptic
186 meningitis and it is self-limiting and has an average recovery of around
187 12 days to 18 days.

188 However, sometimes patients with MRS have only undiagnosed fever
189 and urinary voiding difficulty, with few symptoms of meningeal
190 irritation. Such cases are difficult to diagnose, but the possibility of MRS
191 should be considered.

192

193 CONCLUSION:

194

195

196 In conclusion, MRS may have been underreported or overlooked and
197 may, therefore, be more common than is currently believed. It is
198 important to recognize that adults may have MRS that has a good long-
199 term prognosis. The awareness of MRS and its clinical course by both
200 neurologists and urologists may help prevent unnecessary investigation
201 and treatment and can reduce patients' anxiety. Further studies are
202 required to resolve the mechanism underlying these syndromes.

203

204

205 References

206

207 1. Sakakibara R, Uchiyama T, Liu Z, et al. Meningitis-retention
208 syndrome. An unrecognized clinical condition. *J Neurol* 2005; 252:
209 14959

210

211 2. Herbaut AG (1993) Neurogenic urinary retention. *Int Urogynecol J*

- 212 4:221–228
213
214 3. Abhishek Krishna, Pavan Devulapally & Ibrahim Ghobrial (2012)
215 Meningitis retention syndrome, *Journal of Community Hospital*
216 *Internal Medicine Perspectives*, 2:1, 15761,
217
218 4. Wheeler JS, Jr, Culkin DJ, Walter JS, Flanigan RC. Female urinary
219 retention. *Urology*. 1990; 35:428–432.
220
221 5. Connolly KJ, Hammer SM. The acute aseptic meningitis
222 syndrome. *Infect Dis Clin North Am* 1990; 4:599.
223
224 6. Sakakibara R, Kishi M, Tsuyusaki Y, Tateno A, Tateno F,
225 Uchiyama T, *et al.* “Meningitis-retention syndrome”: A review.
226 *NeurourolUrodyn* 2013; 32:19-23. [+](#)
227
228 7. Fotini Ntziora, Aristidis Alevizopoulos, Kostas Konstantopoulos,
229 Sofia Kanellopoulou, Dimitrios Bougas, and Konstantinos
230 Stravodimos Volume 2011, Article ID 741621, 3 pages.
231
232 8. Gen Ishii, *, Kenichi Hata, Soichiro Aoki, Masayasu Suzuki,
233 Takahiro Kimura, Shin Egawa
234
235 9. A. Hiraga, S. Kuwabara *Journal of the Neurological Sciences* 390
236 (2018) 261–264
237
238
239
240

241 Image 1: MRI Brain with contrast No leptomeningeal enhancement

242 seen

243

244

245

246

RESULT DETAILS:	COMMENTS:
Epstein-Barr virus, Human cytomegalovirus, Varicella-zoster virus, Enterovirus , Human Parvovirus B19, Adenovirus, Herpes simplex Virus 1, Herpes simplex Virus 2, Human herpes virus 6, Human herpes virus 7, Parechovirus and Japanese encephalitis virus.	Not detected
Gram positive bacteria: Staphylococcus spp., Staphylococcus aureus, Enterococcus spp., Streptococcus spp., Streptococcus pneumoniae, Streptococcus agalactiae, Listeria monocytogenes.	Not detected
Gram negative bacteria: Pseudomonas aeruginosa, Acinetobacter baumannii, Stenotrophomona maltophilia, Escherichia coli, Klebsiella pneumoniae, Serratia marcescens, Enterobacteriaceae, Proteus spp., Morganella morganii, Neisseria meningitides	Not detected
Fungi: Candida spp., C.albicans	Not detected
Resistance markers: mecA, vanA, vanB, blaSHV, blaCTX-M, KPC, SME, NMC-IMI, GES, VIM, GIM, SPM, NDM, SIM, IMP, OXA23, OXA24, OXA48, OXA51, OXA58.	Not detected

247

248 Table 1: CSF Meningoencephalitis panel

249

250

Comment [BAR22]: Send this table in "Word" format (editable), not as picture.

