

CrossRef DOI of original article:

What Caused Her Fall? A Clinical Case of Leg Swelling

N. Stacy Amadife¹ and Dr. Constance Mere²

¹ Howard University Hospital

Received: 1 January 1970 Accepted: 1 January 1970 Published: 1 January 1970

Abstract

Minimal change disease (MCD) is typically not a disease seen in adults as it comprises only 10-15

Index terms—

1 Introduction

Minimal change disease (MCD) is a nephrotic syndrome primarily seen in children and early teens (1). In adults, the major nephrotic disease remain Focal Segmental Glomerulosclerosis (higher prevalence in people of African origin) and Membranous nephropathy (higher prevalence in people of European descent). It is rare to see MCD in adults as it comprises only 10-15% of cases (2). Patients usually present with sudden onset edema, proteinuric kidney injury, and hyperlipidemia. Disease can be further characterized as primary/idiopathic or secondary. Typical secondary causes include drugs such as non steroidal antiinflammatory drugs (NSAID) and Lithium, infections such as Syphilis, Mycoplasma, allergens, autoimmune disorders like Systemic Lupus Erythematosus (SLE), Celiac disease, diabetes, as well as malignancies including Non Hodgkin Lymphoma and bronchogenic carcinoma (1). The pathogenesis hypothesis states that disruption of actin cytoskeleton within the podocyte and basement membrane in conjunction with a disrupted immune system cause an increase in mediating factors leading to filtration of albumin into the urinary system (2).

2 II.

3 Case Report

We present a case of a 47 -year old African-American woman with biopsy proven MCD.

The patient presented to the Emergency Department (ED) after sustaining a fall at home. She hit her head albeit did not lose consciousness. She reports myalgia, nausea, and acute worsening of paresthesia in her hands and lightheadedness over the past one month. In addition, she notes worsening leg swelling spanning three weeks and involuntary 30 pound weight gain over the past month. She denies any herbal medication use, illicit drug use, or recent illness. The last time she took NSAIDs was for menses four months prior to presentation and totaled no more than six doses.

Her Exam notable for obese woman with generalized edema, normal heart sound intensity, no adventitious breath sounds, and no focal neurological deficits. Patient oriented to person, place, and situation.

Neurology initially consulted due to concern for MS flare and patient completed four day course of daily Solumedrol. Head imaging showed no evidence of acute flare.

Nephrology consulted due to concern for nephrotic syndrome. Urine studies, autoimmune workup including SPEP, UPEP, ANCA, RPR, serum free light chains recommended. Results all negative. ANA positive and reflex to titre pending. Double stranded DNA (dsDNA) quantified as indeterminate. Urine protein: creatinine ratio is 6.64g/day. Interventional Radiology (IR) consulted for kidney biopsy. Patient started on IV Furosemide , IV albumin, and anti hypertensives. Protein and sodium restriction intake enforced. Plan for biopsy of kidney.

Biopsy results on electron microscopy demonstrated effacement of podocytes and absence of tubule-reticular structures. On light microscopy normal appearing glomeruli seen with some evidence of interstitial edema. Immunofluorescence demonstrated no glomerular positivity with IgG, IgA, IgA, C3, C1q, kappa, lambda, or

fibrinogen. Faint one plus glomerular positivity seen with IgM, however non specific. No specific tubulointerstitial or vascular positivity with any of the above mentioned immunoreactants.

Patient started on prednisone 80mg every morning. Testing for G6PD negative, and patient started on Dapsone 100mg day for *Pneumocystis jiroveci* pneumonia (PJP) prophylaxis.

4 At time of discharge, labs demonstrated

5 Discussion

The incidence of primary MCD in adults is not well defined (1). The hallmark of biopsy results is absence of immunofluorescence staining for varying antigens/immunoreactant (IgG, IgM, IgA, C1, etc.) and effacement of podocytes (1) on electron microscopy. If other features are seen, it cannot be MCD (1). Nonetheless, low intensity staining of C3 and IgM can be normal (8). This was seen in our patient. Typically, this disease has a higher prevalence in children who are often steroid responsive. By two weeks, 50% of kids have responded, whereas the percentages are more sobering in adults. Here, 75% have responded by 13 weeks (8). Furthermore, adults have greater risk for progression to renal failure in adults. In study by Nolasco et. al, ten of nineteen patients progressed to renal failure, with eight of those eventually requiring dialysis (9).

There have been few reports of adults with MCD and even fewer in patients with comorbidities such as HIV and MS, as in our patient. However, given the biopsy results this remains a case of primary MCD. In spite of the patient's history of well controlled HIV, HIV Associated nephropathy (HIVAN) remained on the differential. It is important to recognize that anti retroviral therapy (ART) does not protect against MCD. In fact, seven of eight patients were diagnosed with MCD while on ART. HIVAN detected in only one case (4). On the other hand, a viral load of greater than 400 was also not a good predictor of HIVAN, as only 37% of such patients diagnosed with HIVAN (6).

While the patient did have abrupt onset edema, hyoalbuminemia, and proteinuria, her serum creatinine was not greater than 2. Above 2 is more typical for HIVAN (5). Variability in labs and presentation echo the importance of biopsy. Biopsy will demonstrate tubular atrophy and dilation as well as flattened epithelial cells in setting of collapsing FSGS (due to podocyte proliferation). Furthermore, a large number of tubular and glomerular cells coated with HIV RNA (4). Important to note that low CD4 count and presence of proteinuria are not predictive of HIVAN. Furthermore, a viral load of greater than 400 was also not a good predictor of HIVAN, as only 37% of such patients diagnosed with HIVAN (6).

Our patient did not have HIVAN in spite of medical history. Similarly, one could postulate MCD secondary to MS drugs. While the patient was treated for presumed flare on admission, there are very little reports in the literature of Glatiramer induced nephrotic syndrome. On the other hand, Interferon gamma B (IFN B) has been linked to MCD after long time use. Kumasake et al. describe case of a woman with MS on IFN B who develops MCD after 21 months on MS treatment (7). Our patient was never treated with IFN B and no evidence seen on renal biopsy.

IV.

6 Conclusion

MCD is a type of nephrotic syndrome, characterized by a urine protein/creatinine of 3500mg and greater. Patients usually present with sudden onset edema, proteinuric kidney injury, and hyperlipidemia. It is believed that disruption of actin cytoskeleton within the podocyte and basement membrane in conjunction with a disrupted immune system cause an increase in mediating factors leading to filtration of albumin into the urinary system and marked proteinuria. Patients need close follow up to ensure steroid responsiveness, as measured by reduction in proteinuria. Due to long duration of steroid therapy, patient's need PJP prophylaxis. This includes Atovaquone or Dapsone. It is prudent to be aware that adults have greater risk for progression to renal failure (than children). In a study by Nolasco et. al, ten of nineteen patients progressed to renal failure, with eight of those eventually requiring dialysis. If adults have truly failed steroid therapy, there will be no improvement after four months. The next step is to discuss the efficacy of second line non-steroidal therapies such as calcineurin inhibitors. This case highlights a case of primary MCD in a woman with HIV and MS, while illustrating that even when patients have other comorbidities or concern for secondary causes of MCD, it is imperative to obtain a renal biopsy to clarify the picture. ¹

¹B © 2022 Global JournalsWhat Caused Her Fall? A Clinical Case of Leg Swelling

93 [Arrestier et al.] , R Arrestier , Satie Anne-Pascale , Z Shao-Yu , E Plaisier , C Isnard-Bagnis , P Gatault .
94 [(2007)] , 10.2215/CJN.03531006. 17699450. 2007 Apr 11. 2 p. .

95 [Waldman et al. (2007)] ‘Adult minimalchange disease: clinical characteristics, treatment, and outcomes’. M
96 Waldman , R J Crew , A Valeri , J Busch , B Stokes , G Markowitz , D ’agati , V Appel , G . *Clin J Am Soc*
97 *Nephrol* 2007 May.

98 [Nolasco et al. (1986)] ‘Adult-onset minimal change nephrotic syndrome: a long-term follow-up’. F Nolasco , J S
99 Cameron , E F Heywood , J Hicks , C Ogg , D G Williams . 3747335. *Kidney Int* 1986 Jun. 29 (6) p. .

100 [Lionaki ()] ‘Clinical Characteristics and Outcomes of Adults with Nephrotic Syndrome Due to Minimal Change
101 Disease’. Sophia Lionaki . *Journal of clinical medicine* 2021. 10 p. 3632.

102 [Estrella et al. ()] ‘HIV type 1 RNA level as a clinical indicator of renal pathology in HIV-infected patients’. M
103 Estrella , D M Fine , J E Gallant . *Clin Infect Dis* 2006. 43 p. .

104 [Fine ()] ‘Kidney Biopsy in HIV: Beyond HIV-Associated Nephropathy’. Derek M Fine . *American journal of*
105 *kidney diseases* 2008. 51 p. . (Web)

106 [Vivarelli et al. ()] ‘Minimal Change Disease’. M Vivarelli , L Massella , B Ruggiero , F Emma . 27940460. *Clin*
107 *J Am Soc Nephrol* 2017 Feb 7. 2016 Dec 9. 12 (2) p. .

108 [Brocheriou ()] ‘Minimal change nephrotic syndrome in patients infected with human immunodeficiency virus:
109 A retrospective study of 8 cases’. I Brocheriou . 10.1186/s12882-018-1132-x. [https://doi.org/10.1186/](https://doi.org/10.1186/s12882-018-1132-x)
110 [s12882-018-1132-x](https://doi.org/10.1186/s12882-018-1132-x) *BMC Nephrology* 2018.

111 [Kumasaka et al. (2006)] ‘Nephrotic syndrome associated with interferon-beta-1b therapy for multiple sclerosis’.
112 R Kumasaka , N Nakamura , K Shirato , T Fujita , R Murakami , M Shimada , M Nakamura , H Osawa ,
113 H Yamabe , K Okumura . 10.1007/s10157-006-0424-9. 17009081. *Clin Exp Nephrol* 2006 Sep. 10 (3) p. .

114 [Maas ()] ‘The Clinical Course of Minimal Change Nephrotic Syndrome with Onset in Adulthood or Late
115 Adolescence: A Case Series’. Rutger J Maas . *American journal of kidney diseases* 2016. 69 p. . (Web)