

Madelung's Disease in an African-American Patient

Nabeel Sarhill, MD

Ajay Kumar, MD

Lloyd Cook, MD

Adnan Tahir, MD

Kinda Barakat, MD

Madelung's disease, also known as benign symmetric lipomatosis, multiple symmetrical lipomatosis, or Launois-Bensaude syndrome, is a rare metabolic condition of unknown etiology characterized by massive fatty deposits distributed in a symmetrical pattern.¹⁻⁵ Two types of Madelung's disease have been described. In type 1 disease, fat accumulates around the neck/nape of the neck, shoulders, upper arms, and upper back.^{1,2,6} In type 2 disease, lipomas extend over the body, including around the hips and upper legs. The characteristic lipomas as well as their absolute symmetry may lead to misdiagnosis of Madelung's disease as obesity. The disease usually affects middle-aged men of Mediterranean descent and is associated with chronic alcoholism. This article describes a case of Madelung's disease in an African-American man, which has rarely been reported in the literature.

CASE PRESENTATION

Initial Presentation and History

A 47-year-old African-American man presented to the clinic with a chief complaint of multiple large swellings on his torso. He claimed that he had never before consulted a physician for any illness. Approximately 10 years ago, he first noticed small lumps on his torso, which grew over time. The patient denied any associated pain or discomfort and noted that his main concern was cosmetic appearance. He reported experiencing occasional frontal headaches, especially in the morning, without any visual complaints, nausea, or vomiting.

Medical history was significant for excessive alcohol consumption and nicotine abuse. The patient had been consuming alcohol daily for more than 20 years (10-12 beers daily and an unknown quantity of wine). He had been nicotine dependent for more than 20 years, with a 30-pack-year smoking history. Family history was significant in that his mother abused alcohol and his father had multiple strokes.

Evaluation and Diagnosis

Physical examination revealed multiple large globular swellings (4-5 inches in diameter) on the nape of the neck, shoulders and shoulder blades, arms, abdomen, and groin (**Figure 1** and **Figure 2**). Dilated veins were noted over the chest. Funduscopic, cardiovascular, respiratory, and neurologic examinations were unremarkable. Results of laboratory analysis, including complete blood count, liver function tests, electrolytes, fasting lipid profile, and kidney function tests, were within normal limits. A radiograph of the neck (**Figure 3**) revealed excessive adipose tissue with markedly thin musculature.

The patient was diagnosed clinically with Madelung's disease type 1 after he refused biopsy. Diagnosis with type 1 disease was based on the distribution pattern of multiple lipomas and the previous history of heavy alcohol and nicotine abuse. The patient was referred for a general surgical consultation and for plastic surgery, but he did not follow-up. He was contacted by phone, and he indicated that he was not interested in surgery as treatment.

DISCUSSION

Benign symmetric lipomatosis was first described by Brodie in 1846.^{2,3} In 1888, Madelung presented a series of 35 patients,^{2,4} and in 1898, Launois and Bensaude added 30 cases to the Madelung series for a total of 65 patients.^{2,5} Since then, Madelung's disease and Launois-Bensaude syndrome have become synonymous with benign symmetric lipomatosis.

Dr. Sarhill is a fellow, Division of Hematology and Oncology, University of Texas Health Science Center, San Antonio, TX. Dr. Kumar is a resident, Dr. Cook is an attending physician, Dr. Tahir is an attending physician, and Dr. Barakat is a volunteer physician; all are at the Department of Internal Medicine, St. Vincent Charity Hospital/St. Luke's Medical Center, Case Western Reserve University, Cleveland, OH.



Figure 1. Photograph of the back of a patient with Madelung's disease showing lipomas around the neck and arms.

The incidence of Madelung's disease varies from 1 to 10 in 25,000 persons and occurs with a male-to-female ratio of 15 to 30:1.^{1,2,6-8} This uncommon disease predominantly affects middle-aged men (range, 30-65 years) of Mediterranean descent. It has also been reported in European and Asian patients but has not been previously noted in African Americans.^{1,6,9-11} It is possible that African-American patients with Madelung's disease, especially type 2 disease, have been misdiagnosed with obesity. Hypotheses regarding the cause of this disease have not included race as a possible risk factor.^{1,2,7,12} Multiple symmetric lipomatosis may occur sporadically or in families, and autosomal dominant transmission has been postulated in the latter.^{1,2,6} More than 90% of patients with Madelung's disease have a history of chronic, although not necessarily heavy, alcohol consumption; however, some patients have no history of alcohol consumption.^{2,11} Abstinence from alcohol does not reverse the disease.

The cause of Madelung's disease is unknown, although many hypotheses have been proposed. One theory suggested that alcohol may induce disturbances in the mitochondrial DNA (mtDNA) in fat cells.^{7,12} Mitochondria are important for metabolism of lipid and alcohol. Alcohol abuse increases the formation of acetaldehyde, which could lead to premature oxidative ageing of mtDNA, favoring fat accumulation.



Figure 2. Photograph of the front of a patient with Madelung's disease showing lipomas around the neck, arms, and chest. The "bull-neck" appearance is called Madelung's collar.

Clinical Presentation and Diagnosis

Two types of Madelung's disease have been described in the literature based on the distribution pattern of lipomas. In type 1, which primarily affects men, fat accumulates around the neck/nape of the neck, upper back, shoulders, and upper arms.^{1,2,6} These patients present with an extraordinary "bull-neck" appearance (called Madelung's collar) (Figure 2). Lipomas may extend into the mediastinum and may obstruct the trachea or vena cava.⁹ Fat over the remainder of the body appears normal. Diagnosis in type 1 requires clinical recognition that the fat masses are symmetric and the distal arms and legs are spared.^{1,2,6,9-11} The patient in this case report had dilated veins across the chest, suggesting obstruction of upper body venous return.

In type 2 disease, which occurs in both men and women and produces exaggerated female fat distribution, lipomas extend over the body, giving the appearance of obesity.^{1,2,6} Deep lipomatosis is absent and vena caval and tracheal compression do not occur in type 2 disease. Unlike lipomas in other diseases, the benign fatty masses in either type of Madelung's disease are not enclosed within a membranous capsule.^{1,9,11}

Clinical findings can suggest the diagnosis of Madelung's disease, but laboratory and imaging studies may be needed for further evaluation. Simple radiologic studies such as chest radiograph with routine blood testing may suffice. Computed axial tomography and magnetic resonance imaging may be indicated to demonstrate the presence of the masses and their relation to other vital organs and determine the need for urgent surgery (eg, masses compressing the pericardium or main bronchus). Definitive diagnosis can be made only by biopsy of a fatty mass with underlying muscle to differentiate the mass from other benign or malignant disease.



Figure 3. Plain radiograph of a patient with Madelung's disease showing lipomas around the neck, arms, and chest.

Clinical Course

The clinical course of Madelung's disease involves an initial stage of fast growth lasting several months followed by slow progression over years.^{1,6,9,11} Madelung's disease is associated with peripheral neuropathy, malignant upper airway tumors, diabetes mellitus, hypothyroidism, hyperlipidemia, hyperuricemia, renal tubular acidosis, and other metabolic abnormalities.^{1,2,6,11} Alcoholism is found in 90% of cases and may cause concomitant folate deficiency, macrocytic anemia, and abnormal liver function. In an 8-year follow-up of 9 patients with Madelung's disease, peripheral neuropathies and space-occupying mediastinal syndromes were found to be the most incapacitating complications and, in some cases, the most rapidly progressive complications.¹³ Neuropathy develops years after disease onset and may be sensory, motor, or autonomic; neuropathic foot ulcers also may develop.^{1,2,6,13} Polyneuropathy is noted in 85% of cases, and most cases progress to incapacitation. Histologic evidence from sural nerve biopsies suggests that neuropathy is integral to the disease; specifically, chronic distal atrophy may exist without the axonal degeneration and demyelination that is typically associated with alcohol-induced damage. Central nervous system abnormalities may include defects in evoked potentials.^{6,9,10}

Treatment

No treatment has been reported to improve polyneuropathy, prevent the disease, or stop disease

progression.^{7,10-13} The mainstay of treatment is palliative surgery.^{6,9,12} Surgical removal of lipomas by direct excision, suction-assisted lipectomy, or both can be done, with the approach chosen according to the surgical indication (compression, organ obstruction, or cosmetic reasons) or the size, extent of infiltration, or location of the lipomas.^{6,9-11,14} Treatment is usually unsatisfactory and recurrence is common. Liposuction can be performed multiple times if needed; other advantages over direct excision include less risk, reduced operation time, and smaller incision.^{11,14} Constantinidis et al⁸ reported a series of 11 patients with a mean follow-up of 2.7 years. Results of surgical treatment by combined lipectomy and liposuction (performed as a second surgery) were satisfactory to all patients; however, the disease recurred in 2 patients 1.5 and 2 years after surgery with no serious complications. Another series of 15 patients showed that a long mid-neck transverse skin incision was superior to multiple direct incisions over the lumps with adequate removal of the lipomas and better cosmesis.¹⁴ Also, liposuction was a useful adjunct for contouring a specific body part. Medical treatment with a β_2 -agonist has been tried without any success.¹³⁻¹⁵

CONCLUSION

In previous reports of Madelung's disease, the patients were primarily of European and Mediterranean descent, were 40 to 50 years of age, and had a known history of alcohol use. The patient in this case had similar risk factors but was African American. More basic research is needed to understand the cause of this disease and develop targeted therapy to salvage the existing lipomas and prevent recurrence. **HP**

REFERENCES

1. Nielsen S, Levine J, Clay R, Jensen MD. Adipose tissue metabolism in benign symmetric lipomatosis. *J Clin Endocrinol Metab* 2001;86:2717-20.
2. Adamo C, Vescio G, Battaglia M, et al. Madelung's disease: case report and discussion of treatment options. *Ann Plast Surg* 2001;46:43-5.
3. Brodie BC. Clinical lectures on surgery. Delivered at St. George's Hospital. Philadelphia: Lea & Blanchard; 1846:201-10.
4. Madelung OW. Über den Fetthals (diffuses Lipom des Halses) [article in German]. [von Langenbeck's] *Arch Klin Chir Berlin* 1888;37:106-30.
5. Launois PE, Bensaude R. De l'adenolipomatose symetrique [article in French]. *Bulletin et Memoires de la Societe Medicale des Hospitaux des Paris* 1898;1:298-318.
6. Smith PD, Stadelmann WK, Wassermann RJ, Kearney RE. Benign symmetric lipomatosis (Madelung's disease). *Ann Plast Surg* 1998;41:671-3.

7. Gonzalez-Garcia R, Rodriguez-Campo FJ, Sastre-Perez J, Munoz-Guerra MF. Benign symmetric lipomatosis (Madelung's disease): case reports and current management. *Aesthetic Plast Surg* 2004;28:108-13.
8. Constantinidis J, Steinhart H, Zenk J, et al. Combined surgical lipectomy and liposuction in the treatment of benign symmetrical lipomatosis of the head and neck. *Scand J Plastic Reconstr Surg Hand Surg* 2003;37:90-6.
9. Parmar C, Blackburn C. Madelung's disease: an uncommon disorder of unknown aetiology? *Br J Oral Maxillofac Surg* 1996;34:467-70.
10. John DG, Fung HK, van Hasselt CA, King WW. Multiple symmetrical lipomatosis in the neck. *Eur Arch Otorhinolaryngol* 1992;249:277-8.
11. Wu WH, Fang RH. Multiple symmetrical lipomatosis (Madelung's disease): a case report. *Zhonghua Yi Xue Za Zhi (Taipei)* 1996;58:139-42.
12. Nisoli E, Regianini L, Briscini L, et al. Multiple symmetric lipomatosis may be the consequence of defective noradrenergic modulation of proliferation and differentiation of brown fat cells. *J Pathol* 2002;198:378-87.
13. Enzi G. Multiple symmetric lipomatosis: an updated clinical report. *Medicine (Baltimore)* 1984;63:56-64.
14. Wong DS, Lam LK, Chung JH, et al. Aesthetic considerations in the cervicofacial management of Madelung syndrome. *Scand J Plastic Reconstr Surg Hand Surg* 2003;37:34-40.
15. Leung NW, Gaer J, Beggs D, et al. Multiple symmetric lipomatosis (Launois-Bensaude syndrome): effect of oral salbutamol. *Clin Endocrinol (Oxf)* 1987;27:601-6.

Copyright 2006 by Turner White Communications Inc., Wayne, PA. All rights reserved.