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Case report

Ophthalmoplegia, pigmentary retinopathy, and abnormal cardiac conduction: A rare case of Kearns-Sayre syndrome

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ABSTRACT

Kearns-Sayre syndrome (KSS) is one of the three classic and overlapping phenotypes that result from simplex mitochondrial DNA (mtDNA) deletion syndromes. The rarity of the syndrome has led to a paucity of reported cases in the literature. We present the case of a young female who presented with drooping of her right eyelid, generalized muscle wasting, fatigability of the proximal muscles of her limbs, a nasal twang in her voice, bilateral progressive ophthalmoplegia, and a history of surgically correct ptosis of her left eyelid. Fundoscopy revealed salt-and-pepper-like retinopathy bilaterally. Her electrocardiogram (ECG) findings included an inferior infarct and a left anterior fascicular block. This case highlights the importance of multifaceted investigations and prompt diagnosis in resource-limited settings for effective management in suspected cases of KSS.

1. Introduction

Kearns-Sayre Syndrome (KSS) is a rare and progressive mitochondrial myopathy with a molecular basis that constitutes large deletions in the mitochondrial DNA (mtDNA) [1]. Diagnosis is usually made in the presence of a clinical triad comprising onset before the age of 20 years, pigmentary retinopathy, and progressive external ophthalmoplegia (PEO); along with cardiac conduction defects [2]. With a prevalence rate of 1–3 cases per 100,000 individuals and a paucity of reported cases, further studies are necessary to unravel the complexities of this life-threatening disorder [3]. In this report, we describe what we believe is one of the few reported cases of Kearns-Sayre Syndrome as a suspected diagnosis in a young woman in a resource-limited setting.

2. Case report

A 25-year-old Pakistani woman was admitted to our medical ward via the emergency department in March 2022. She presented with drooping of her right eyelid for the past year. Examination revealed generalized muscle wasting, fatigability of the proximal muscles of her limbs, and a nasal twang in her voice. Bilateral restriction of extraocular muscle movements was observed. The muscle bulk was decreased in all four limbs, but the power and tone were normal. She gave a history of surgically corrected ptosis of her left eyelid when she was 8 years old. Her mother claimed that ever since the patient had been 9–10 years old, she had been less active compared to her siblings and had always struggled to put on weight. No one else in her family ever experienced similar symptoms. The patient had no complaints of palpitations or any visual problems. A list of possible diagnoses was made, which included myasthenia gravis, multiple sclerosis, Horner's syndrome, and oculomotor nerve compression or ischemia.

The patient was referred to the ophthalmology department for a consult. She had a visual acuity of 6/9 bilaterally and bilateral progressive ophthalmoplegia (Fig. 1) with extra-ocular movements only in the downward direction and restricted or absent in all other directions. Salt-and-pepper-like retinopathy was observed bilaterally on fundoscopy (Fig. 2, arrows). The eye department advised a referral to the cardiology unit with a suspected diagnosis of KSS.

She was transferred to the cardiology unit where an ECG and echocardiography were done and the reports were sent to the medical ward team. Her ECG revealed sinus tachycardia, an inferior infarct, and a left anterior fascicular block (Fig. 3). On echocardiography, a slightly thickened tip of the anterior mitral leaflet with mild prolapse of both mitral valve leaflets and posteriorly directed eccentric jet of mild mitral regurgitation was observed. Trace tricuspid regurgitation with an estimated mean pulmonary artery pressure (MPAP) of 18 mmHg was observed.

The medical ward team advised the patient to undergo elaborative

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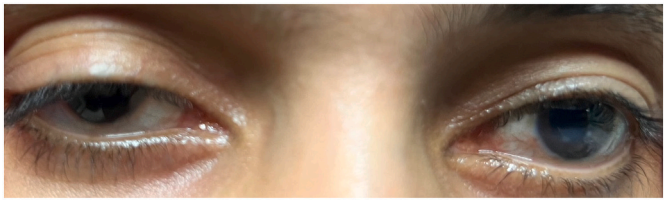

Fig. 1. Right eyelid drooping and bilateral external ophthalmoplegia.

testing which included a chest x-ray to check the presence of a Pancoast tumor or a thymoma associated with myasthenia gravis, erythrocyte sedimentation rate (ESR) to rule out orbital myositis, and serum levels of anti-ACh receptor antibodies (to rule out myasthenia gravis) and creatine kinase (CK). Her lab reports revealed a normal chest x-ray, negative anti-ACh receptor antibodies, normal ESR, and an increased serum creatine kinase (CK) level with a value of 345 U/L. The patient refused lumbar puncture, brain imaging, and brain angiography; these tests were advised to rule out multiple sclerosis and to assess for any oculomotor nerve compression or ischemia. In light of these investigations effectively ruling out alternative diagnoses along with the presence of the classic triad of KSS – onset before the age of 20 years, pigmentary retinopathy, progressive external ophthalmoplegia, and heart block – a diagnosis of KSS was made.

She was advised to undergo a muscle biopsy and follow a management plan comprising right eye tarsorrhaphy, right eyebrow elevation to uplift the droopy eyelid, administration of beta blockers for heart rate control, physical therapy, and consultation with a neurologist. The patient refused the management plan, and she was discharged with the advice that she should visit for a follow-up in four weeks. The patient was lost to follow-up.

3. Discussion

While other authors have reported cases with arrhythmias, syncope, cardiomyopathy, and cardiac conduction system abnormalities, we note that our patient had an inferior infarct as revealed by the ECG [3]. Our patient did not undergo DNA analysis because of limited resources and financial constraints. The presence of metabolic and endocrine disorders has been previously documented with clinical manifestations such as short stature, hypogonadism, diabetes, thyroid disease, hyperaldosteronism, hypomagnesemia, and bone abnormalities. However, none of these metabolic disorders were present in our patient [4]. An overlap of findings with myasthenia gravis made it essential to rule out the autoimmune disorder through testing for anti-ACh receptor antibodies, which gave a negative result for our patient [2,5]. A muscle biopsy would aid in confirming the diagnosis but due to the limitation of resources, [3] it was not performed in our case and the diagnosis was made primarily by confirming the clinical triad and by carefully ruling out other conditions mimicking the symptoms in our patient.

Patient's consent

Informed consent was taken from the patient for the publication of

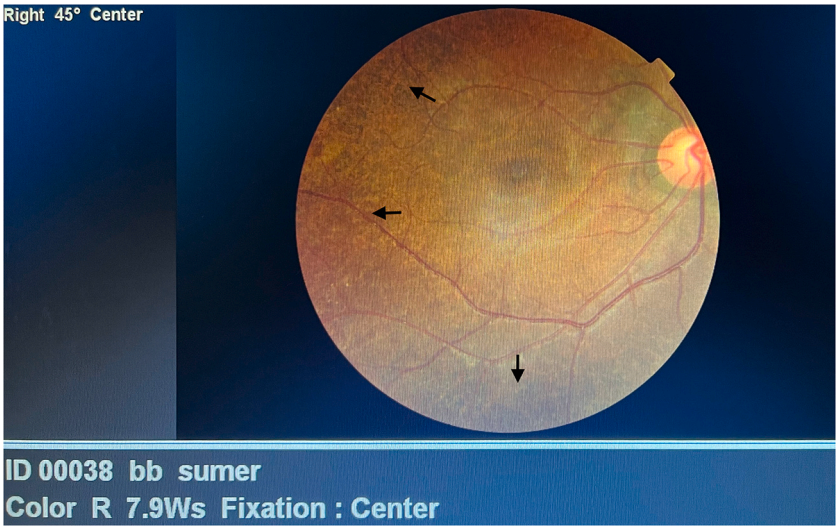

Fig. 2. Fundoscopic examination demonstrating salt-and-pepper-like retinopathy (arrows).

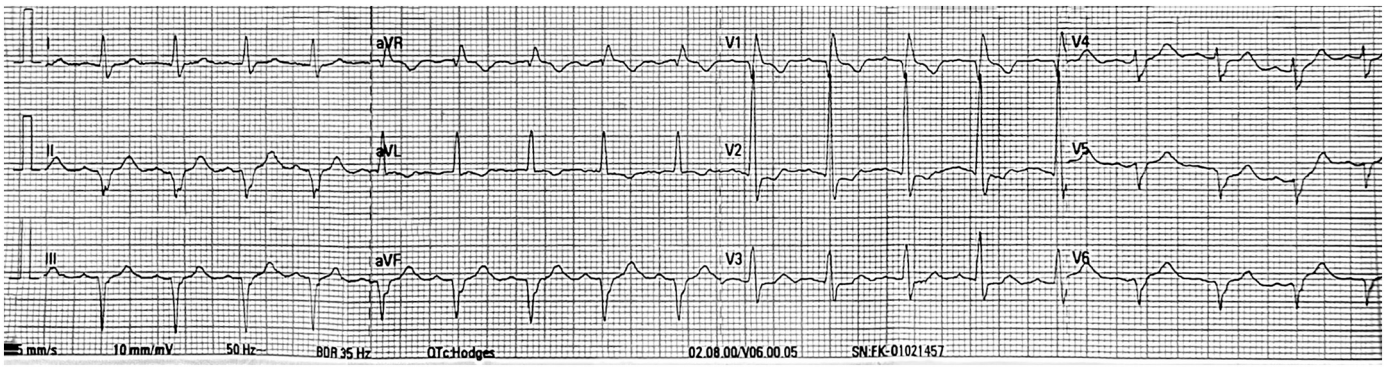

Fig. 3. Electrocardiogram (ECG) revealing sinus tachycardia, an inferior infarct, and a left anterior fascicular block.

this case.

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Disclaimer

None to declare.

Authorship

All authors had access to the data and a role in writing this manuscript.

Author agreement

All authors had access to the data and a role in writing this manuscript. All authors materially participated in the research and article preparation. All authors have approved the final article.

CRediT authorship contribution statement

Arsalan Nadeem: Conceptualization, Data curation, Methodology, Software, Writing – original draft. **Sumayya Umar:** Supervision, Software, Writing – review & editing, Resources. **Sohaib Rehmani:** Supervision, Software, Writing – review & editing. **Mustafa Javaid:** Supervision, Writing – review & editing.

Declaration of Competing Interest

None.

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References

[1] A. Barrientos, J. Casademont, J.M. Grau, F. Cardellach, J. Montoya, X. Estivill, A. Urbano-Márquez, V. Nunes, Oftalmoplejía externa progresiva y síndrome de Kearns-Sayre: estudio clínico y molecular de 6 casos [Progressive external ophthalmoplegia and the Kearns-Sayre syndrome: a clinical and molecular study of 6 cases], Med. Clin. (Barc.) 105 (5) (1995 Jul 1) 180–184 (Spanish. PMID: 7630231).

[2] A. Goldstein, M.J. Falk, Mitochondrial DNA deletion syndromes, in: M.P. Adam, D. B. Everman, G.M. Mirzaa, R.A. Pagon, S.E. Wallace, Bean LJH, K.W. Gripp, A. Amemiya (Eds.), GeneReviews®[Internet], University of Washington, Seattle, Seattle, WA, 2003 Dec 17, pp. 1993–2022 [updated 2019 Jan 31]. (PMID: 20301382).

[3] M. Leal, C. Dhoble, J. Lee, D. Lopez, L.S. Menéndez, A rare case of Kearns-Sayre syndrome in a 17-year-old Venezuelan male with bilateral ptosis as the initial presentation, Oxf. Med. Case Rep. 2016 (3) (2016 Mar 3) 34–36, https://doi.org/10.1093/omcr/omw007 (PMID: 26949540; PMCID: PMC4776051).

[4] J.N. Harvey, D. Barnett, Endocrine dysfunction in Kearns-Sayre syndrome, Clin. Endocrinol. 37 (1) (1992 Jul) 97–103, https://doi.org/10.1111/j.1365-2265.1992.tb02289.x (PMID: 1424198).

[5] S.S. Ahmad, S.A. Ghani, Kearns-Sayre syndrome: an unusual ophthalmic presentation, Oman J. Ophthalmol. 5 (2) (2012 May) 115–117, https://doi.org/10.4103/0974-620X.99377 (PMID: 22993469; PMCID: PMC3441018).