

Rhinolith with Nephrolithiasis following Prolonged use of Topiramate: A Rare Incidence

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ABSTRACT

Topiramate is a neuromodulatory drug widely used for refractory seizures, migraine and alcohol dependence. Chronic use of this medication can cause metabolic acidosis in patients secondary to inhibition of carbonic anhydrase. It impairs the normal compensatory drop in urine pH. These factors can lead to nephrolithiasis. Although it is difficult to get an exact mechanism for stone formation in other organ of the body, we report a case of topiramate-induced nephrolithiasis along with nasal stone which is rare in medical literature.

Keywords: Topiramate, Rhinolith, Nephrolithiasis.

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INTRODUCTION

The term ‘rhinolith’ or ‘nasal stone’ is used to define the mineralized mass located in the nasal cavity.¹ Rhinoliths are benign calcareous concretions that develop usually as a result of the deposition of salts on intranasal foreign body.² Rhinolithiasis is considered a rare condition with an incidence of 1:10,000 ENT patients.³ Topiramate is a novel neuromodulatory agent commonly prescribed for treatment of seizure disorder, migraine headache prophylaxis and alcohol dependence. Topiramate is known inhibitor of the enzyme carbonic anhydrase and chronic use can lead to the development of metabolic acidosis.⁴ As a result, patients may have risk to form stones overtime. Herein, we report a case of nephrolithiasis along with nasal stone, likely induced by topiramate use.

CASE REPORT

A 54-years-old man was referred to ENT OPD from Psychiatric Department for nasal obstruction. On examination, there was a grayish white foreign body in right side nasal cavity. Diagnostic nasal endoscopy (Fig. 1) was done, showing a rhinolith in the right middle meatus. On computed tomographic (CT) scan of nose and paranasal sinus, there was a radiopaque foreign body in the right nasal cavity (Fig. 2). It was removed by endoscope which was gritty in sensation and confirmed as rhinolith by histopathology report. He had a history of addiction to alcohol. He was admitted in psychiatric ward for alcohol

withdrawal syndrome like tremor in hand, restlessness, severe headache and vomiting. From history it was known he was taking topiramate since 1 year. Keeping in mind for nephrolithiasis as a complication by prolonged use of topiramate an ultrasonography of abdomen was done to rule out kidney stone. Kidney stone was confirmed in ultrasound (Fig. 3). Then patient had weaned off topiramate and has begun another medication regimen for alcohol dependence.

DISCUSSION

Topiramate is a sulfamate-substituted fructose-1, 6-diphosphate analog⁵ with a molecular weight of 339.37 Da.⁶ Topiramate has potent anticonvulsant properties, similar to phenytoin and carbamazepine, though its mechanism of



Fig. 1: Endoscopic view of nasal cavity

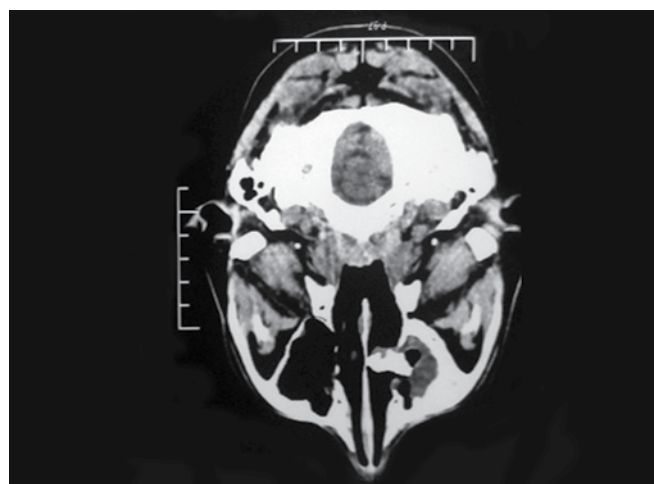


Fig. 2: CT scan showing rhinolith



Fig. 3: USG of kidney showing nephrolithiasis

action appears to be dissimilar.⁷ Topiramate is occasionally used to treat withdrawal of alcohol to inhibit excess neuronal excitation.⁸

Treatment with topiramate causes systemic metabolic acidosis, markedly lower urinary citrate excretion, and increased urinary pH. These changes increase the propensity to form calcium phosphate stone in kidney.⁹

The exact mechanism of the rhinolithiasis is not completely understood. However, formation of rhinolithiasis occurs after complex processes that take long time. Usually foreign body entrance into the nasal cavity initiates the process of the rhinolith formation. A foreign body, inspissated mucopus or even a blood clot acts as a nucleus for concretion and receives a coating of calcium, magnesium, phosphate, carbonate and becomes a rhinolith. Also inflammation, increased density and stagnation of nasal secretions and precipitation of mineral salts play pivotal role for rhinolith formation.¹⁰ In this present case, it is difficult to explain the formation of rhinolith on biochemical basis. Inspissated mucopus and stagnated nasal secretion may occur in metabolic acidosis due to hyperventilation and vomiting which occurs with prolonged use of topiramate. Vomiting may occur due to metabolic acidosis or due to excess alcohol addiction. The vomitus may come to nasal cavity and create nidus formation for rhinolith. Several case reports have described the association between topiramate and the development of kidney stones, but this combination of rhinolith and nephrolithiasis had not been recognized earlier. Further study may be required for explaining the stone formation in other organ of the body in case of prolonged use of topiramate.

CONCLUSION

Topiramate is an effective medication used in partial or refractory seizure disorder, migraine and alcohol

dependence. Prolonged use of this drug can produce a significant metabolic acidosis in certain individuals through an inhibitory effect on carbonic anhydrase. Further study is needed to completely elucidate the mechanism of stone formation in nose and kidney.

Because topiramate use is becoming prevalent, we should be aware of the potential risk of stone formation.

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