

## Onion grating as an alternative to pilocarpine drops in a patient with Adie pupil

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### Dear Editor,

Adie pupil manifests with mydriatic pupil, which is unresponsive to light and is moderately responsive to accommodation. Adie pupil is confirmed with rapid miosis of the affected pupil with 0.125% pilocarpine drops [1]. Pilocarpine drops as the main drug for reversing mydriasis in the affected pupil may not be available everywhere and may cause some side effects. Recently, we reported a case of Adie pupil during a migraine attack [2]. Here, we report a unique case of Adie pupil, in which mydriatic pupil responded to onion grating.

Briefly, the patient was a 27-year-old woman with a history of migraine and change in the size of the left pupil after one of her attacks. Neurological examination including visual acuity, perimetry, fundoscopy and reflexes were normal. Serological tests for autoimmune disease and infectious diseases such as syphilis were normal. Brain magnetic resonance imaging and magnetic resonance angiography were normal. In the eye examination, the pupil did not respond to light but in the near reflex its size decreased slowly. Prolonged vasospasm which gave rise to infarction of the postganglionic fibres could be a good explanation of the symptoms of our patient. For the cosmetic issue, 0.125% pilocarpine drops were prescribed twice daily and the patient was followed for three years. At first, the patient suffered from near blurred vision which subsided gradually. During this period, the patient realized that when she was slicing or grating an onion, her mydriatic pupil returned to its normal size and the time of accommodation decreased. For example, she reported that it took seconds for her to see the words of a book clearly (accommodation time). This

time decreased after grating an onion. The patient also complained of a vague pain in her left eye after grating an onion or pilocarpine drop usage. We tested for the change in her pupil diameter while she was grating an onion. Immediately after grating an onion, her dilated pupil with a diameter of 5.3 mm became 2 mm wide, which was smaller than the contralateral pupil (3.5 mm). At the initiation of miosis, lacrimation was absent or not significant. The pupil gradually dilated and returned to its previous size in 25 minutes. The pilocarpine test was performed on a subsequent day. Miosis happened in 10 minutes and lasted for about 12 hours. The patient declared that the effect of pilocarpine had increased from 4 hours to 12 hours and the onset of action had decreased when compared with the reaction at the beginning of the disease. We taught her husband to measure the diameter of the pupil while she was crying and he reported no change of pupil size while crying.

Accommodative paresis, tonicity of accommodation and supersensitivity of the ciliary muscle to pilocarpine are three main components of Adie pupil, which is the result of aberrant regeneration of parasympathetic nerve fibres after damage to the ciliary ganglion [3]. The effect of onion can be explained by its weak cholinergic propensity. The pain after pilocarpine and onion grating can be explained by ciliary muscle contraction following muscarinic receptors activation. In a recent study on rats, intravenous onion extract led to relative bradycardia and hypotension, possibly due to its cholinergic propensity [4], which supports our explanation for the effect of onion on Adie pupil. Blurred near vision is a result of accommodation paresis. Gradually, accommodation paresis recovers, as in our patient [5]. The time

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of accommodation could be longer as a result of slow reaction to accommodation [3] and consequently increased aberration due to the relatively dilated pupil [6]. This patient subjectively felt a shorter accommodation time after onion grating or pilocarpine drops, which can be attributed to decreased aberration after relative miosis.

As pilocarpine may not be available everywhere and generally patients will not tolerate it because of the intermittent accommodative spasm [3], onion grating seems to be a cheap alternative for therapeutic purposes in these circumstances. Further work on a greater number of patients with Adie pupil is needed to confirm the effect of onion on Adie pupil.

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