Graefe's Arch Clin Exp Ophthalmol
(2006) 244: 1360–1362

CASE REPORT

DOI 10.1007/s00417-006-0267-9

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Intracranial migration of silicone oil from an eye with optic pit

Received: 1 November 2005
Revised: 6 January 2006
Accepted: 7 January 2006
Published online: 8 March 2006

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Abstract *Background:* The origin of subretinal fluid in eyes with optic pit remains controversial. *Methods:* Case report. *Results:* The authors found that silicone oil, implanted into an eye that developed proliferative vitreoretinopathy after surgery for optic pit-related macular detachment, has migrated into the subarachnoid space. *Conclusions*: As this case shows, cerebrospinal fluid may migrate into the subma: ular space in eyes with optic pits.

Keywords Optic pit · Vitrectomy · Silicone oil · Cerebrospinal fluid · Subarachnoid space

Introduction

Optic pits are congenital depressions in the optic nerve head. Unless discovered on routine examination, pits are typically diagnosed following visual deterioration caused by serous macular detachment. While most authors [2] agree that vitrectomy with peripapillary laser and gas tamponade is an effective and atraumatic treatment for the condition, the source of the subretinal fluid remains controversial.

Investigators consider the vitreous [7] or the cerebrospinal space [6] as the source of the subretinal fluid, which then enters the subretinal space via the pit cavity. Vitreous traction may also play a role in the pathogenesis [5].

We present a case in which previously implanted silicone oil was detected intracranially, demonstrating communication between the subarachnoid and subretinal spaces via the optic pit.

Case report

In May 1988, we performed vitrectomy, 200-degree peripapillary laser retinopexy, and 20% sulfur-hexafluoride implantation in the right eye of a 15-year-old girl who presented with count fingers vision due to a bullous macular detachment and cystoid macular edema. She had bilateral optic pits. An uneventful postoperative period with gradual improvement followed; eventually, her visual acuity reached 20/20 in the right eye.

In October 1991, she presented with severe visual deterioration in the left eye due to optic pit-related macular detachment but refused surgery until April 1992. A similar surgical procedure was then performed. The vitreous, as in the right eye, was strongly adherent to the retina, but was successfully detached. Visual acuity in the left eye slowly improved until June 1995 when she returned with hand motion vision due to an inferior retinal detachment

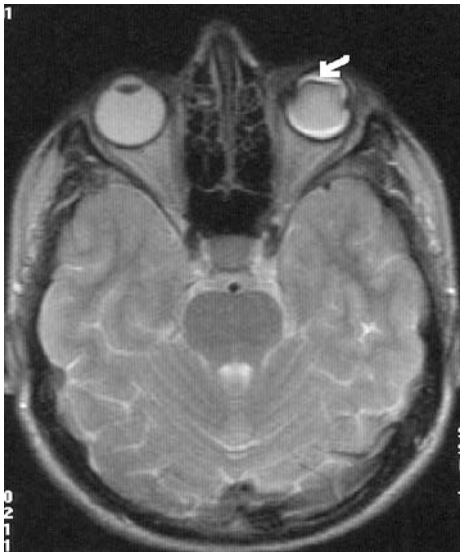

Fig. 1 MRI image, T2 weighted. Silicone oil is present in the left orbit (*arrow*), showing a characteristic signal

involving the macula; no break could be identified. Silicone oil was implanted and the patient was cautioned to keep her appointments.

The patient did not return until March 1997. Reoperation was performed with lensectomy, peeling of proliferative membranes, and silicone oil reimplantation. The patient was again warned not to miss her follow-up visits.

In March 1998, she presented with loss of light perception in the left eye and mildly elevated intraocular pressure (26 mmHg). The retina could not be visualized due to band keratopathy and a thickened, fibrotic posterior capsule. Ultrasonography was not performed, since the eye had no vision and the patient did not consent to oil removal or any other surgical procedure; antiglaucoma medications were prescribed.

In January 2001, she underwent neurological evaluation because of strong and persistent headaches. Emulsified silicone oil was found in the left eye as well as in intracranially (Figs. 1 and 2). The intraocular pressure was as high as 36 mmHg, which again was normalized with medication.

Discussion

Subretinal migration of silicone oil from the vitreous cavity has been described in eyes with optic nerve head abnormalities [4], providing clinical evidence that the submacular fluid, even in the absence of a retinal break, may originate in the vitreous cavity. This case demonstrates, for the first time to our knowledge, that, at least in some eyes, the macular detachment in eyes with optic pit can indeed be caused by cerebrospinal fluid: the intravitreally implanted silicone oil migrated through the pit into the subarachnoid space. The existence of such channels has been proven in morning glory syndrome: intrathecally injected contrast dye was identified in the subretinal space [1]. It is also possible that vitreous traction plays a role, albeit limited: we have consistently found in patients undergoing vitrectomy for optic pit-associated macular detachment that the vitreous is more strongly adherent to the retina than in other conditions in patients of

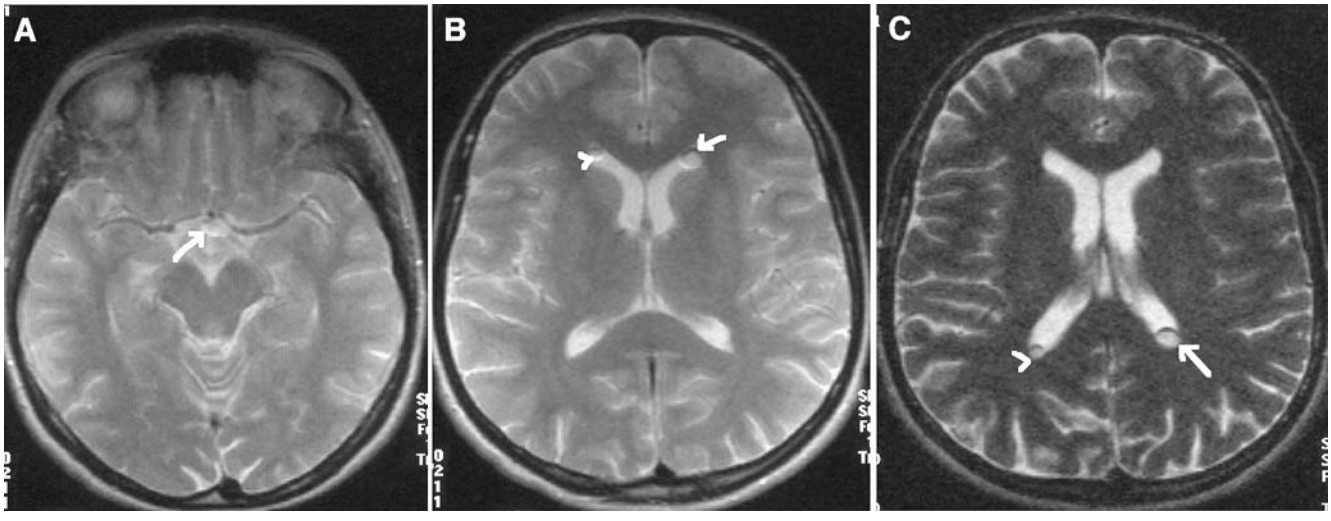

Fig. 2 Intracranial silicone oil with the characteristic signal seen on Fig. 1. **a** Axial MRI image, T2 weighted. In the supine position, the optic chiasm and left optic tract (*arrow*) are surrounded by silicone oil droplets. **b** MRI image, T2 weighted. In the supine position, ovoid silicone oil droplets are visible in the horns of the lateral ventricles: a 47 mm droplet on the *right* (*arrowhead*) and an 8 mm droplet on the *left* (*arrow*). **c** Axial MRI image, T2 weighted. In the prone position, a 4 mm (*right*; *arrowhead*) and an 8 mm (*left*; *arrow*), ovoid silicone oil droplets are present in the occipital horn of both ventricles. The droplets float in the cerebrospinal fluid and move with changes in head position

similar age. High intraocular pressure [3] did not play a role in the pathogenesis in our case.

While vitrectomy, proper laser retinopexy, and gas tamponade appear to achieve permanent closure of the channel between the pit and the subretinal space and result in a dry macula [2], prevention remains elusive; in retrospect, we should have considered performing laser prophylaxis in the second eye before retinal detachment occurred.

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