

Sub-inner limiting membrane hemorrhage in a patient with Terson syndrome

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Abstract

Purpose To report a case of bilateral Terson Syndrome with sub inner limiting membrane hemorrhage associated with a rare finding: perimacular fold.

Methods The patient, a 34 years old female with aneurysmal subarachnoid hemorrhage and bilateral Terson syndrome was admitted to the Ophthalmology department, complaining of blurred vision. Core vitrectomy, hyaloid detachment, peeling of the ILM and aspiration of the sub inner limiting membrane hemorrhage was performed. Once the inner limiting membrane of the left eye was peeled off, we noticed a particular aspect: the perimacular fold.

Result Although our patient suffered from a massive vitreous haemorrhage the postoperative outcome was favorable with a final best corrected visual acuity of 20/30.

Conclusions In patients with bilateral Terson syndrome we recommend early surgery, especially if the neurological status allows it, a good visual acuity being helpful for the neurophysical rehabilitation of the patient.

Keywords Terson syndrome · Vitreous hemorrhage · Sub-inner limiting membrane hemorrhage · Subarachnoid hemorrhage · Vitrectomy

Introduction

Terson syndrome was initially defined as vitreous hemorrhage secondary to subarachnoid hemorrhage (SAH). Presently, this syndrome encompasses intraocular (vitreous, sub-hyaloid, sub-retinal, intraretinal or preretinal) hemorrhage due to SAH, traumatic brain injury or intracerebral hemorrhage [1].

In practice, patients complain of blurred vision, but cognitive impairment secondary to elevated intracranial pressure can delay diagnosis [2]. The gold standard for diagnosis of Terson syndrome is ophthalmoscopic examination with fundoscopy [3]. Pars plana vitrectomy performed within 3 months of the hemorrhage appears to lead to better visual acuity than those performed later than 3 months. Early surgical intervention is strongly recommended in bilateral Terson syndrome [4].

We present the case of a patient diagnosed with aneurysmal subarachnoid hemorrhage and bilateral Terson syndrome, that underwent bilateral pars plana vitrectomy (1 week apart), resulting in significant improvement in visual acuity in both eyes.

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Case report

The patient, a 34-year-old female, was admitted to the Ophthalmology Department, complaining of blurred vision.

Visual acuity was hand motion (HM) in each eye (OU). Intraocular pressure (IOP) was 18 and 19 mmHg in right eye (RE) and, respectively, left eye (LE). Fundus examination and ocular ultrasound revealed vitreous hemorrhage in both eyes. The patient had a history of brain surgery—posterior communicating artery clipping with a Yasargil clip for aneurysmal subarachnoid hemorrhage.

Pars plana vitrectomy of the left eye was performed. Once core vitrectomy has been performed, the posterior hyaloid, which was fairly thick, was subsequently detached (Fig. 1a, b). Intraoperatively, we identified a sub-inner limiting membrane hemorrhage, so inner limiting membrane (ILM) peeling and aspiration of the bleeding were performed (Fig. 2, b, c, d). Since the ILM was very thick and detached in the macular area by the blood accumulated beneath, no stain agent was necessary to perform the maneuver. A week later, pars plana vitrectomy of the right eye was performed, using the same surgical method, without ILM peeling as no sub-ILM hemorrhage was present.

At 1-month follow-up, fundoscopy images in both eyes showed the absence of intraocular blood (Fig. 3a, b). Best-corrected visual acuity increased to 20/30 in each eye.

Discussion

The literature quotes several causes for the sub-inner limiting membrane hemorrhage like: Terson's

syndrome, Valsalva phenomenon (vomiting, coughing, physical effort), craniocerebral trauma, blood dyscrasias [5]. Our paper presents the case of a young patient with Terson syndrome in both eyes and sub-ILM hemorrhage in the LE.

Similarly to the other cases quoted, this type of preretinal hemorrhage had occurred in the premacular area. Significant decrease in the visual acuity was induced by the central location of the hemorrhage. The accurate diagnosis was established intraoperatively. The preretinal hemorrhage could be removed in the right eye after inducing posterior vitreous detachment. In the left eye, since the hemorrhage was preretinal, peeling of the ILM was necessary.

Morris and colleagues offered a classification of Terson syndrome which histologically describes the hemorrhage potential location: 'sub-membranous hemorrhagic macular cyst' (sub-ILM) and 'preretinal hemorrhagic macular cyst' (between ILM and posterior hyaloid) [6]. We found both the locations in our case: the first in left eye and the second in the right one.

An OCT of the macula would have been a helpful tool. However, in the case of a recent bleeding, the OCT of the macula can be inconclusive, due to the hyper-reflectivity of the fresh blood [5]. In our case, a preoperative diagnosis could not have been established, because the patient also had an associated dense intravitreal hemorrhage, which made it impossible for us to perform an OCT of the macula in order to determine the exact location of the preretinal hemorrhage (behind the hyaloid or the ILM). Treatment options vary in such cases as this one. There have been reports of cases in which the hemorrhage resorbed spontaneously [7]. Consequently, there are

Fig. 1 a, b Detachment of the hyaloid using the vitrector

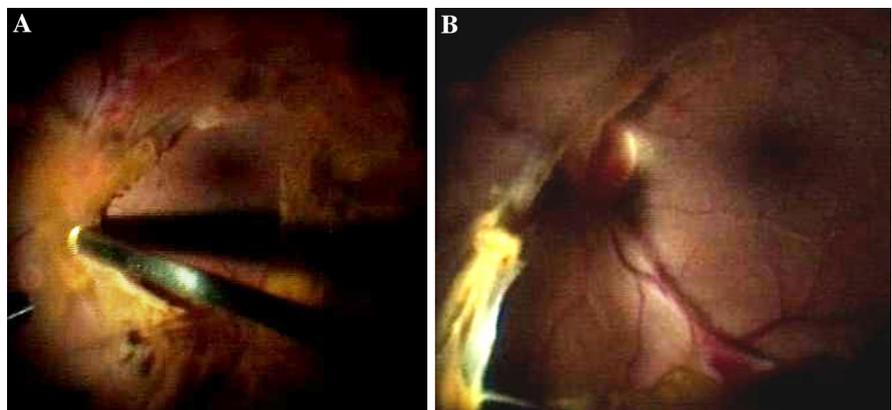


Fig. 2 a, b, c, d Intraoperative aspects of the ILM peeling in the left eye; sub-ILM hemorrhage

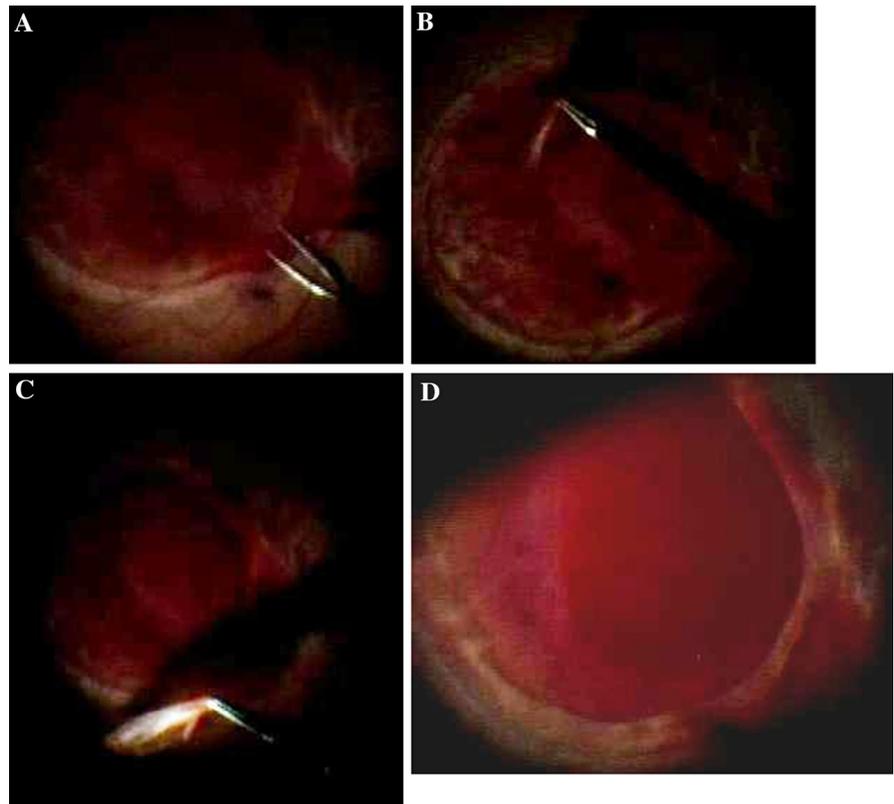
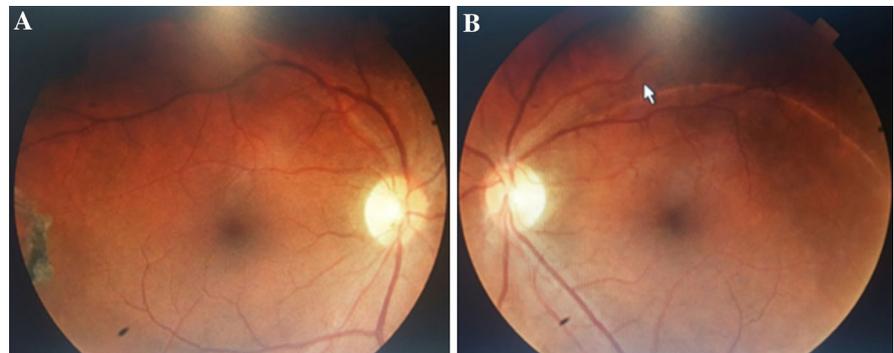


Fig. 3 a, b Postoperative aspect showing the absence of blood after vitrectomy in both eyes; perimacular fold in the left eye (b, arrow)



practitioners who prefer a more conservative approach, namely periodic evaluation of the patient.

Another minimally invasive treatment option is to perform a hole in the ILM using an Nd-YAG laser. The preretinal blood drips into the vitreous cavity, where it will reabsorb faster. The treatment is effective in the case of recent bleeding with an onset of no more than 21 days before, and which are located under the hyaloid membrane [8]. Sometimes, probably due to hardening of the blood clot and thickening of the

posterior hyaloid, Nd-YAG laser is unable to perforate the hyaloid, so other therapies are necessary [6].

The intravitreal injection of anti-VEGF agents appears to facilitate the resorption of the hemorrhage [9]. There have been also reports of the use of intravitreal tPA (tissue plasminogen activator) in order to liquefy and facilitate the resorption of the hemorrhage [7].

Because our patient suffered a bilateral dense vitreous hemorrhage, we decided to perform surgery,

which is recommended in the event of a dense hemorrhage that does not resorb spontaneously.

We suggest that these cases be treated as early as possible as blood is toxic for the retina and prolonged contact between blood and retina can cause irreversible retinal damage. Other complications of pre-retinal hemorrhage are: cataract, epiretinal membranes, glaucoma, retinal detachment, proliferative vitreoretinopathy and amblyopia in infants [5].

Once the inner limiting membrane of the left eye was peeled off, we noticed a particular aspect, which has been quoted by other authors as well, namely the perimacular fold (Fig. 3b). Bhatnagar et al. report the occurrence of the perimacular fold in a young patient with leukemia and preretinal hemorrhage [8]. The authors considered that the perimacular fold appeared due to a rapid accumulation of the blood extravasated from the retinal blood vessels under the inner limiting membrane. It is also considered specific for cases of ‘Shaken Baby Syndrome,’ indicating a poor visual outcome [10]. Visual acuity recovery was very good in our case, though perimacular fold was found after pars plana vitrectomy in the left eye.

The associated thrombocytopenia was a contributing factor. Our patient had a history of blood-clotting disorders, which favored bleeding, the rapid accumulation of blood under the inner limiting membrane and the emergence of the perimacular fold.

The functional surgical outcomes depend on the general status of the patient and on the possible associated lesions. Some authors considered that the presence of a dense vitreous hemorrhage is a factor of poor visual prognosis [6]. Although our patient suffered from a massive vitreous hemorrhage, the postoperative outcome was favorable with a final best-corrected visual acuity of 20/30.

We consider this case to be particularly interesting in view of the fact that the hemorrhage occurred in a relatively young patient and the functional outcome of the surgical intervention was very good. This is the first time that we have encountered blood under the inner limiting membrane, which required peeling of the inner limiting membrane and subsequently aspiration of the blood. A 20/30 recovery of the visual acuity in this patient, who was practically in a comatous status, represents an impressive therapeutic success. In such patients, we recommend early surgery, especially if the neurological status allows

it, a good visual acuity being helpful for the neuro-physical rehabilitation of the patient.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflicts of interests.

Ethical approval This article does not contain any studies with human participants performed by any of the authors. This article does not contain any studies with animals performed by any of the authors.

Informed consent Informed consent was obtained from the individual in this case report.

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