

## A Case of Valsalva Retinopathy Associated with Straining at Stool

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—Abstract—

The Valsalva maneuver is described as an expiratory effort against a closed glottis or airway. It leads to elevation of retinal venous pressure and may result in retinal hemorrhage. A fifty two-year-old man presented with an acute reduction of central visual acuity in his right eye which occurred after considerable straining at stool. Detailed past medical history revealed that he suffered from chronic constipation and hypertension. There were one disc sized subhyaloid hemorrhage and three small intraretinal hemorrhages around the fovea at the dilated fundus examination. After three months of follow-up without any treatment, the retinal hemorrhages resolved without any sequelae. Here we report a patient with sudden visual loss and retinal hemorrhage.

**Key Words:** Constipation, Preretinal hemorrhage, Valsalva maneuver, Valsalva retinopathy

### Introduction

The Valsalva maneuver is an expiratory effort against a closed glottis or airway.<sup>1)</sup> It is a circulatory response to increasing airway pressure up to 40 mmHg for about 30 seconds with changes in heart rate and beat-to-beat blood pressure. Initially, the raised intrathoracic pressure alters the baseline circulatory

pressures, and the arterial pressure is consequently increased. At the same time, ventricular filling and cardiac output decrease. Then tachycardia, increased systemic vascular resistance and increase in peripheral venous pressure, which tends to restore the venous return, cause the consequent decline in arterial pressure to the level before starting the Valsalva maneuver. As a result of

compensation the intrathoracic pressure is restored to normal, venous return improves and cardiac output increases. However, persistent peripheral arteriolar resistance results in the temporary blood pressure overshoot and bradycardia.<sup>2, 3)</sup>

The Valsalva maneuver may accompany strenuous exertion, emesis, violent coughing, tenesmus, end-stage labor, blowing into musical instruments and crush or compression injuries. Sudden elevation of venous pressure may give rise to a variety of signs involving the head and upper body including: subconjunctival hemorrhages, skin petechiae and cyanosis.<sup>4)</sup> The increase in retinal venous pressure may cause local rupture of superficial capillaries. This leads to retinal hemorrhage. We report a patient with sudden visual loss and retinal hemorrhage following heavy straining at stool.

#### Case report



Fig. 1. Multiple retinal hemorrhages in the right eye following a Valsalva maneuver associated with staining at stool.

A fifty two-year-old man presented with an acute reduction of central visual acuity in his right eye; this occurred while considerable straining at stool two days previously. A detailed past medical history revealed that the patient suffered from chronic constipation for three years without medication. Eight years ago, he was diagnosed with hypertension and had been on oral hypertensive medication.

On presentation, the corrected vision was 5/200 OD and 20/20 OS. There was no afferent pupillary defect and examination of

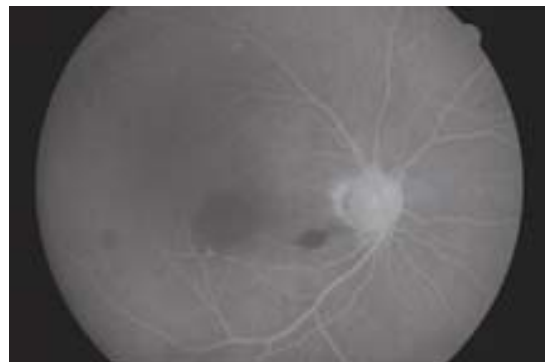
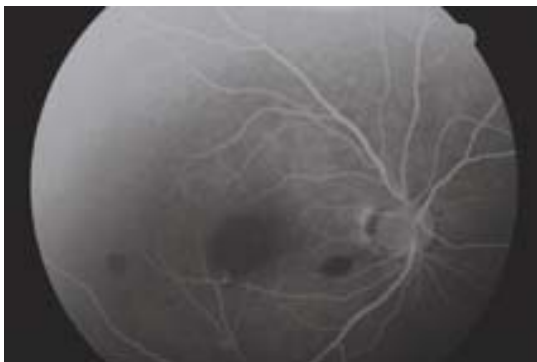


Fig. 2. Fluorescein angiography of the right eye showing blocking of background choroidal fluorescence by the hemorrhages without any vascular leakage in early phase and late phase.

the anterior segment was unremarkable. The dilated fundus examination revealed one disc sized subhyaloid hemorrhage at the fovea on the right, accompanied by three small scattered intraretinal hemorrhages around fovea (Fig. 1). Fluorescein angiography of the right eye demonstrated blocking of the background choroidal fluorescence by the hemorrhages without any vascular leakage from the early phase to late phase (Fig. 2). There was no evidence of underlying vascular pathology. The appearance of the fundus combined with an associated history of physical exertion was consistent with the diagnosis of Valsalva retinopathy. Five months later at follow-up without any treatment, fundal examination revealed total resolution of the hemorrhages and the patient's vision returned to normal (Fig. 3).



Fig. 3. Multiple retinal hemorrhages resolved without any treatment after 5 months follow-up.

### Discussion

Valsalva retinopathy was initially described by Duane in 1972. He reported three cases

involving retinal hemorrhages in the macular region presumably secondary to a sudden increase of intrathoracic pressure.<sup>5)</sup> Since then, Valsalva retinopathy has been reported following weight-lifting sports,<sup>4)</sup> aerobic exercise,<sup>6)</sup> pregnancy,<sup>7)</sup> labor,<sup>8)</sup> riding a motorcycle,<sup>9)</sup> blowing up balloons,<sup>10)</sup> transrectal biopsy of the prostate and as a complication of colonoscopy.<sup>11, 12)</sup> de Crecchio and colleagues<sup>13)</sup> reported that Valsalva retinopathy is associated with a congenital retinal macrovessel. However, the presence of a congenital retinal macrovessel in the macular area is a rare occurrence, and Valsalva retinopathy has rarely occurred after the Valsalva maneuver.

When Valsalva retinopathy occurs, patients have blurred vision or central scotoma. Presenting visual acuity usually ranges from 6/6 to 6/12, although on rare occasions it may be reduced to 6/60 or counting fingers.<sup>4)</sup> The hemorrhage is invariably located at or near the fovea and is secondary to a spontaneous rupture of the perifoveal capillary plexus following the Valsalva maneuver. Valsalva retinopathy is typically a preretinal hemorrhage which is well-circumscribed and round or dumb-bell shaped. However, subretinal, intraretinal, subhyaloid and vitreous hemorrhages can be observed with Valsalva retinopathy.<sup>14)</sup> Shukla et al<sup>15)</sup> evaluated Valsalva retinopathy by optical coherence tomography and showed that the exact site of the retinal hemorrhage was the subinternal limiting membrane. Most cases

of Valsalva retinopathy resolve spontaneously within weeks to months, and have a good visual prognosis. Nd:YAG laser membranotomy seems to be helpful for the rapid clearance of a large premacular hemorrhage by causing disruption of the internal limiting membrane, allowing the blood to gravitate into the inferior vitreous cavity and allowing absorption of blood. However, complications such as retinal or choroidal hemorrhage, retinal hole and vitreous hemorrhage have been reported after this procedure.<sup>16)</sup>

This is the first reported case occurring associated with straining at stool in Korea. When patient with chronic constipation complain about visual disturbance, Valsalva retinopathy should be considered in the differential diagnosis through detailed history taking. In the case presented here,

Valsalva retinopathy developed in a hypertensive patient but the relationship between Valsalva retinopathy and hypertension is not clear. The effect of hypertension on Valsalva retinopathy requires further investigation.

### 요 약

기도가 닫힌 상태에서 강하게 숨을 뱉어내는 발살바법은 망막의 정맥압을 상승시키고 이에 따라 망막 출혈을 유발시킬 수 있다. 힘든 배변을 경험한 55세 남자가 우안의 중심시력 감소로 인해 본원을 방문하였다. 전신적인 질환으로 고혈압, 만성 변비를 앓고 있었고 동공

을 산대하여 정밀 안저검사를 한 결과 유두 한 개 정도 크기의 망막전 출혈과 황반외주위로 작은 크기의 망막내 출혈이 관찰되었다. 특별한 치료없이 망막 출혈은 자연 흡수되어 시력은 정상으로 회복되었다. 배변으로 인해 급작스런 시력감퇴를 나타낸 발살바 망막증을 경험하였기에 보고하는 바이다.

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