CASE REPORTS

Anterior Ischaemic Optic Neuropathy following Liposuction in a Patient with Optic Disc Drusen

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ABSTRACT

Ischaemic optic neuropathy (ION) following non-ocular surgeries is a rare but devastating complication. Spine and cardiovascular surgical procedures are well known to be accompanied by this complication. ION after liposuction surgery is gaining attention during the past decades due to the escalating demand for this procedure. We report a case of unilateral anterior ION (AION) after abdominoplasty and liposuction in an eye with optic disc drusen (ODD), which has not been reported previously. The presence of ODD is not only an independent risk factor for AION in young patients, but could also be the underlying cause of the ischaemic insult to the optic nerve head in haemodynamically unstable patients.

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Introduction

Vision loss due to ischaemic optic neuropathy (ION) is a rare complication following non-ocular surgical procedures, most notably after spine and cardiac surgeries.¹ Recently, a few cases with ION after abdominal liposuction procedures have been reported.^{2–6} Considering the growing demand for this type of cosmetic surgery, the occurrence of ION is a potential emerging complication. A large amount of blood loss, history of idiopathic intracranial hypertension (IIH), and hypercoagulable state have been postulated to be the promoting factors.³ We present a 30-year-old female with optic disc drusen (ODD) who developed anterior ION (AION) following liposuction and surgical abdominoplasty. This is the first report to posit this constellation of clinical findings.

Case presentation

A 30-year-old woman without previous medical illness underwent abdominoplasty and large volume liposuction of the back, flanks, intergluteal region, and thighs under general anaesthesia. Her preoperative weight was 90 kg and her body mass index (BMI)

was 30.42 kg/m². Her medical records indicated a pre-operative blood pressure of 120/75 mmHg, pulse rate of 70 beats per minute, fasting blood sugar of 94 mg/dl, and haemoglobin (Hb) level of 13.4 g/dl (haematocrit of 40.7%). The surgical procedure lasted about 4 hours, in which about 3 litres of fluid was extracted. The patient was discharged the same day but began to notice painless vision loss in the left eye the day after the surgery. The neurological examination was within normal limits and she was referred to the Neuro-ophthalmology clinic 6 days after the procedure. The body weight was 82 kg and BMI was 27.71 kg/m² on presentation. The best-corrected visual acuity was 20/20 in the right eye (OD) and 20/30 in the left eye (OS) with a left relative afferent pupillary defect. Ishihara colour scores were 14/14 OD and 10/14 OS. The ocular movements, anterior segment examination, and intraocular pressure were normal. On fundus examination, however, optic disc swelling in the left eye was observed (Figure 1a,b). A fluorescein angiography study showed leakage of the optic nerve head of the left eye compatible with a diagnosis of AION (Figure 1c,d). Automated perimetry (Humphrey 24–2, Allergan-Humphrey, San Leandro, Ca, USA) revealed prominent visual field constriction OS but

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Figure 1. Colour fundus photographs and fluorescein angiograms of both eyes at the first visit: (a) Colour fundus photograph OD showing a cupless optic disc and a splinter haemorrhage near the superior temporal arcade. (b) Colour fundus photograph OS showing a swollen optic disc. The venous phase of the fluorescein angiograms shows (c) blocked fluorescence due to a splinter haemorrhage OD and (d) diffuse leakage from the optic nerve head OS.

Figure 2. (a) Superior and inferior arcuate visual field defects OS and a normal visual field OD at the first visit. (b) Circular peripapillary OCT scan showing diffuse and increased RNFL thickness OS.

a normal visual field OD (Figure 2a). Peripapillary circular optical coherence tomography (OCT) scans (Spectralis HRA+OCT; Heidelberg Engineering, Heidelberg, Germany) depicted peripapillary retinal nerve fibre layer (RNFL) thickening OS, but a normal

Figure 3. Colour fundus photographs and fundus autofluorescent images of both eyes after 3 months: (a) Colour fundus photograph showing a normal-appearing crowded optic disc with a resolved splinter haemorrhage OD. (b) Colour fundus photograph showing an atrophic optic disc with multiple chalky white lesions (white arrow) on the nasal surface OS. (c) Normal fundus autofluorescence OD. (d) Fundus autofluorescent image showing multiple hyperautofluorescent deposits on the optic disc OS compatible with ODD.

RNFL thickness OD (Figure 2b) The laboratory examination showed that the Hb level was 8.2 mg/dl and the haematocrit was 26.3%. Magnetic resonance imaging (MRI) and magnetic resonance venogram (MRV) of the brain and orbits were normal. A lumbar puncture also revealed a normal opening pressure and cerebrospinal fluid (CSF) composition. The patient received multiple packed blood cell injections to restore the blood loss and high-dose intravenous methylprednisolone (1 g/day for 3 days). After 3 months the best-corrected visual acuity was 20/20 OD and 20/40 OS. Fundus examination now showed an atrophic optic nerve head OS with multiple whitish lesions Figure 3a,b). A fundus autofluorescence study confirmed the presence of ODD on the nasal surface of the optic nerve head OS (Figure 3c,d). A peripapillary OCT now showed significant RNFL loss OS compatible with the visual field constriction in the left eye.

Discussion

IONs are the most frequently reported conditions associated with perioperative visual loss; 73% of

them occurring in the setting of spine surgery. Other associated procedures are mostly major cardiovascular and orthopaedic surgeries.¹ Tumescant liposuction is usually considered a safe procedure for the removal of nearly 1500 ml of localised fat, but when large amounts of fat are aspirated fluid shifts to third spaces, which may cause haemodynamic complications.⁷ ION after liposuction surgery was first reported by Minagar et al.⁸ Since then, a few cases have been reported with a similar clinical history. Foroozan et al.⁹ reported a case of bilateral AION after liposuction surgery and suggested that large volume fat removal and the haemodynamic instability that ensued was the causative factor. However, haemodynamic instability and hypotension occur in many surgical and nonsurgical conditions, yet ION happens rarely. Individual predisposing factors or a constellation of multiple factors are possible explanations.¹⁰ Optic disc perfusion vulnerability due to elevated CSF pressure was the proposed predisposing factor in another case reported by Monteiro et al.¹¹ Since the demographics of patients with IIH and the patients who choose cosmetic abdominal surgery are close, they suggested general screening for the presence of optic disc swelling before performing liposuction procedures. Moura et al.⁴ proposed that a small crowded optic disc in the setting of perioperative blood loss and overhydration was the predisposing factor for ION in their patient. The methylenetetrahydrofolate reductase (MTHFR) homozygous and heterozygous to prothrombin II variant mutation was suggested to be the underlying cause of optic nerve infarction in a patient with post-liposuction bilateral posterior ION reported by Rath et al.⁵

In our report, AION occurred in a haemodynamically compromised patient following liposuction surgery in the eye with prominent ODD. The presence of ODD itself is now considered to be an independent risk factor for AION.^{12,13} ODD could be identified in up to 51% of patients with AION under the age of 50 by enhanced depth imaging OCT (EDI-OCT). The presence of ODD probably contributes to the propagation of compartment syndrome and optic nerve ischaemia. The pattern of visual field loss in our case was also noticeable. In contrast with the typical altitudinal field defect of AION, superior and inferior arcuate field defects

were seen with partially preserved central vision. The involvement of superior and inferior retinal nerve fibres with sparing of the papillomacular nerve fibre bundle is also in concordance with the location of ODD in this patient. That again suggests that the location of ODD not only defined the type of visual field defect but also was the cause of the ischaemic attack in the first place. The American Association of Anaesthesia in 2012 released a practice advisory for perioperative blindness associated with spine surgery, which can be used in a patient undergoing surgeries with a higher risk of perioperative ION. These recommendations include avoiding prolonged prone position, minimising blood loss by using appropriate surgical and anaesthesia techniques, avoiding hypotension, monitoring haemoglobin and haematocrit levels and performing a blood transfusion if needed, and keeping head at or above the heart level to minimise venous congestion.¹⁴ Currently, no treatment, including antiplatelet agents, steroids, or intraocular pressure-lowering agents, has been proven to be effective in the management of post-operative ION, and prevention is the key to avoiding morbidity. Based on our observation in this patient and since ODD are recognised as a risk factor for AION it is prudent to look for them any time a surgical procedure with the potential risk of haemodynamic instability is planned and to proceed scrupulously to try to avoid this devastating complication.

Conclusion

This is the first reported case of AION after liposuction in a patient with ODD. It is crucial to discuss the chance of post-operative visual loss with patients choosing liposuction before the operation and to ensure that fluid loss and anaemia are treated promptly. The presence of ODD is considered to be an independent risk factor for AION in young patients. The practitioner should be aware of possible risk factors that increase the chance of ION after liposuction procedure and take especial care to avoid haemodynamic instability in patients with ODD.

Declaration of interest statement

The authors declare that there is no conflict of interest.

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