

A 20-year-old, otherwise fit and healthy woman attended for a bimaxillary osteotomy. A sagittal split osteotomy was done using the Hunsuck modification, and was uneventful. At the time of splitting the right side an accessory IAN was noted travelling away from the main body of the nerve towards the buccal cortex, and then subdividing further (Fig. 1). There was no obvious accessory mental foramen, which suggested a bifid mandibular canal with a single mental foramen. This was not apparent from the preoperative plain radio graphs.

There is a wide variation in the prevalence of bifid mandibular canals found on plain radiography and cone-beam computed tomography. In a review of over 2000 orthopantomograms by Sanchis et al,³ 0.35% were identified as showing a bifid mandibular canal.

Histological examination shows that bifid mandibular canals contain nerve bundles and arteries.⁴ Possible complications could include: unsuspected bleeding, paraesthesia, traumatic neuroma, and nerve injury. We know that the position of the IAN can be highly variable, and its anatomical position has been postulated to have a potential impact on the likelihood of neurosensory disturbance after sagittal split osteotomy.⁵ This case highlights an uncommon anatomical variant of which the orthognathic surgeon should be mindful.

Conflict of interest

We have no conflicts of interest.

Ethics statement/confirmation of patient's permission

Ethics approval not required. All images are non-identifiable but the patient's written consent has been obtained and can be provided on request.

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Treatment outcomes of lateral canthotomy and cantholysis for orbital compartment syndrome

Sir,

Orbital compartment syndrome is a rise in intraorbital volume and pressure that reduces blood flow to the retina and optic nerve. It is characterised by decreased vision, proptosis, raised intraocular pressure, pain, and a fixed, dilated pupil, or a relative afferent defect of the pupil. Ischaemia rapidly leads to infarction and permanent visual loss. Immediate lateral canthotomy and cantholysis¹ is traditionally recommended within two-hours for optimal visual restoration.² We present the speed of treatment and visual outcomes of these patients in our hospital.

St George's Hospital audit department granted permission for this study (DB2070).

Patients who had been diagnosed with the syndrome and treated with lateral canthotomy and cantholysis between May 2011 and June 2016 were identified through the discharge codes “retrobulbar haemorrhage” or “lateral canthotomy/cantholysis”.

A total of 15 patients were identified (Table 1). Primary canthotomy and cantholysis did not adequately lower the orbital pressure in five. Of these one had successful repeat cantholysis, and four had an orbital drain inserted; one was operated on again 23 days later for a rebleed. It was not necessary to repair any lids.

The final Snellen visual acuity was 6/9 or equal to baseline vision before injury in 11/13 patients, and worse in 2/13, median (range) follow-up 217 (2–1708) days (Table 2).

This study highlights seven key learning points. Close ocular monitoring after lateral canthotomy and cantholysis is imperative to ensure that orbital pressure is adequately reduced,¹ as five patients required further urgent surgical treatment to achieve this.

Canthotomy and cantholysis beyond the traditional two-hour window can improve vision.

Four patients treated after 3.5, 8.75, 10, and 24 hours had documented visual improvement. Possibly an incomplete arterial occlusion extended the critical period beyond

Table 1

Table showing the clinical findings, treatment and outcomes of the 15 patients with orbital compartment syndrome.

Case No.	Age (years)	Sex	Side	Mechanism of injury	Bleeding risk factors	Pupil	IOP (mmHg)/ "tense orbit"	Further operation after initial canthotomy and cantholysis	Time from injury to canthotomy/ cantholysis	Time from presentation to canthotomy/ cantholysis	Visual acuity at presentation (Snellen)	Visual outcome at most recent clinic (Snellen)	Vision regained to pre-injury levels?
1	69	F	Left	Trauma - punch injury	Low platelets	APD	36	No	8 hrs 30 mins	3 hrs	CF	NR	Yes
2	68	M	Right	Trauma- wood chip	aspirin	APD	34	A rebleed 23 days later required repeat lateral canthotomy and cantholysis, orbital decompression of the floor and endonasal maxillary anostomy	3 hrs 30 mins	1 hr	6/36	6/6	Yes
3	54	M	Right	Trauma - fall from bike	None	APD	Tense	No	3 hrs 3 mins	1 hr 44 mins	Unconscious	6/6	Yes
4	66	F	Right	Cataract surgery with sub tenons anaesthetic	clopidogrel and aspirin	RAPD	Tense	To insert an intraocular lens	1 hr 30 mins	1 hr 30 mins	NPL	6/36	No (previously 6/24)
5	90	F	Left	Trauma - fall	None	APD	Tense	No	6 hrs	1 hr 48 mins	NPL	NPL	Yes
6	24	F	Right	Trauma - punch injury	None	RAPD	NR	No	2 hrs 30 mins	2 hrs	NR	6/6	Yes
7	75	F	Left	Trauma - fall	apixaban	APD	Tense	Repeat lateral canthotomy, surgical drainage and drain insertion	4 hrs 30 mins	2 hrs 15 mins	NPL	NPL	No (previously 6/9)
8	31	F	Right	Carotid angiography	clopidogrel and aspirin	APD	Tense	No	<1 hr	<1 hr	Unconscious	6/9	Yes
9	17	M	Right	Trauma - pedestrian hit by car	None	No RAPD	51	No	10 hrs	10 hrs	6/12	6/5	Yes
10	8	F	Bilateral	Trauma - hairpulling	None	Unable to assess	RE 21 LE 20	left orbital subperiosteal blood drained and drain inserted	18 hrs	3 hrs 30 mins	Unable to assess	Unable to assess	Unable to assess
11	23	M	Right	Trauma - punch injury	None	NR	45	Right drainage of subperiosteal abscess and drain insertion	24 hrs	6 hrs 30 mins	6/18	6/4	Yes
12	43	M	Right	Trauma - shot	None	APD	Tense	No	2 hrs 30 mins	2 hrs 14 mins	Unconscious	HM	Yes
13	24	M	Right	Trauma - punch injury	Alcoholic	RAPD	58	Repeat lateral canthotomy on ward, then exploration and drainage with ligation of bleeding infraorbital artery	8 hrs 45 mins	8 hrs	6/18	6/9-1	Yes
14	57	F	Left	Trauma - fall	Alcoholic	Pinpoint pupils	Tense	Repeat lateral canthotomy on ward	Unknown	4 hrs 35 mins	Unconscious	6/9	Yes
15	10	M	Left	Trauma - pedestrian hit by car	None	NR	Tense	No	3 hrs 20 mins	1 hr 33 mins	Unconscious	6/5	Yes

IOP = intraocular pressure, NR = not recorded, APD = afferent pupillary defect, RAPD = relative afferent pupillary defect, RE = right eye, LE = left eye, HM = hand movement vision, CF = counting fingers.

Table 2
Vision on presentation and after treatment.

	Measurements
Median (range) vision at presentation (Snellen)	6/60 (6/12-NPL)
Median (range) final vision (Snellen)(n = 13)	6/9 (6/5-NPL)
Median(IQR) time from injury to canthotomy and cantholysis (hours)	4 (2.5–8.75)
Median (IQR) time from presentation to canthotomy and cantholysis (hours)	2.23 (1.55–4.58)

NPL = no perception of light.

the four hours for permanent complete optic nerve damage seen in rhesus monkeys.³

Two patients had poor visual outcomes. Case 4, who had a retrobulbar haemorrhage during cataract surgery under sub-Tenon's anaesthesia, was 6/36 five years later. Case 7 had 6/9 vision before injury, and canthotomy and cantholysis after 4.5 hours. Repeat cantholysis with drainage was delayed by 13 hours (while fast atrial fibrillation was brought under control and prothrombin complex concentrate given). She continued to be unable to perceive light and being already only counting fingers in the other eye was subsequently registered severely sight-impaired. Possible predictors of poor visual outcome include no perception of light, vision at presentation, anticoagulants, delay in presentation, and delay in further acute procedures if orbital pressure is not lowered adequately.

The most useful diagnostic sign in all five unconscious patients was a tense orbit.

Unusually, this is the second report of orbital compartment syndrome from causes such as: hair braiding,⁴ rupturing subgaleal veins with haematomas tracking into the orbit,⁴ and contrast extravasation during cerebral angiography.⁵

Canthotomy and cantholysis should be based on clinical findings. Most patients had computed tomography before their operations, which delayed treatment that could have saved their sight. Addressing this issue could improve outcomes.

In summary, our results show good documented Snellen visual acuity outcomes after treatment of orbital compartment syndrome in 11 of 13 patients. Treatment after the traditional two-hour window is beneficial, and close monitoring after canthotomy and cantholysis is essential, because a third of patients will require further acute intervention to lower orbital pressure and prevent permanent blindness.

Conflict of interest

We have no conflicts of interest.

Ethics statement/confirmation of patients' permission

Ethics approval not required. Patients' permission was obtained.

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Importance of activity and recreation for the quality of life of patients treated for cancer of the head and neck

Sir,

We read with great interest and thoroughly enjoyed the recent paper by Rogers et al that drew much deserved attention to the importance of activity and recreation in patients who have been treated for cancer of head and neck.¹ Our experience in dealing with these patients has made it evident that the burden of such a disease does not end with its diagnosis and treatment. It extends to self-esteem, confidence, physical outlook, social circle, family inter-relationships and their dynamics, professional work graph, and economic status, among many other aspects of life.

Resuming physical activity and recreation not only has physical benefits, but also affects mental and social health. We have treated many patients who avoided outdoor activities