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Original Article

Clinical outcomes and characterization of intraocular foreign body injuries from a Canadian centre: a 20-year retrospective study and literature review

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Objective: To analyse assessment and management patterns of intraocular foreign body (IOFB) injuries in an urban Canadian setting, providing valuable clinical insights to contextualize management.

Methods: Single-surgeon retrospective chart review from January 2002 to January 2023 examining IOFB patient demographics, investigations, treatments, complications, and best-corrected visual acuity (BCVA).

Results: This study evaluated IOFBs in 32 eyes from 31 patients (96.8% male). Sizes ranged from 1 to 12 mm; 28 (87.5%) were metallic and 15 (46.9%) were work-related injuries. For diagnosis, 19 patients (61.3%) underwent computed tomography (CT) imaging, and 8 (25.8%) received B-scans, with CT detecting IOFBs in 100% of cases and B-scan in 87.5%. At final follow-up, 17 eyes (53.1%) achieved BCVA ≥20/40, up from 7 (23.3%) initially. Presenting BCVA ≥20/200 was associated with a final BCVA ≥20/40 ($P = 0.027$). The IOFB was extracted in 27 eyes (84.4%), retained in 4 (12.5%), and 1 (3.1%) required enucleation. Intravitreal antibiotics were administered in 19 eyes (59.4%), resulting in one presumed case of drug toxicity. Complications were present in 30 eyes (93.8%), totalling 119 recorded overall, with 72 (60.5%) occurring within the first 24 hours. Traumatic cataracts were most common in 27 eyes (84.4%). Less-common complications included siderosis and retinal detachment with proliferative vitreoretinopathy, each occurring in one eye (3.1%). Four eyes (12.5%) developed secondary glaucoma, with 3 cases in retained or delayed extractions.

Conclusions: The IOFB characteristics and patient demographics are consistent with other regions. CT scans were the most effective investigation tool. Extended follow-up is recommended to monitor complications, particularly in retained or significantly delayed extractions.

Objectif: Analyser l'évaluation et la prise en charge des corps étrangers intraoculaires (CEIO) en milieu urbain au Canada pour générer une perspective clinique précieuse afin de replacer la prise en charge dans son contexte.

Méthodes: Examen rétrospectif des dossiers médicaux des patients d'un seul chirurgien datés de janvier 2002 à janvier 2023 comprenant les caractéristiques démographiques de patients qui ont eu un CEIO, leurs examens, leurs traitements, leurs complications et leur meilleure acuité visuelle corrigée (MAVC).

Résultats: Notre étude a porté sur la présence d'un CEIO dans 32 yeux de 31 patients (96,8 % des patients étaient de sexe masculin). La taille du CEIO variait de 1 à 12 mm; 28 corps étrangers (87,5 %) étaient en métal; il s'agissait d'un accident de travail dans 15 cas (46,9 %). Dans le cadre de l'examen diagnostique, 19 patients (61,3 %) ont fait l'objet d'une tomographie assistée par ordinateur (TAO), et 8 patients (25,8 %), d'une échographie oculaire (B-scan). La TAO a permis de déceler les CEIO dans 100 % des cas, et les B-scans, dans 87,5 % des cas. Lors du suivi final, la MAVC de 17 yeux (53,1 %) était ≥ 20/40, comparativement à 7 yeux (23,3 %) au départ. Une MAVC ≥ 20/200 lors de l'examen initial était associée à une MAVC finale ≥ 20/40 ($p = 0{,}027$). Le CEIO a pu être retiré dans 27 yeux (84,4 %), est demeuré en place dans 4 yeux (12,5 %) et a entraîné l'énucléation de 1 úil (3,1 %). Des antibiotiques ont été administrés par voie intravitréenne dans 19 yeux (59,4 %), ce qui a donné lieu à 1 cas présumé de toxicité médicamenteuse. Des complications sont survenues dans 30 yeux (93,8 %) pour un total de 119, dont 72 (60,5 %) sont apparues pendant les 24 premières heures. La cataracte post-traumatique était la complication la plus fréquente (27 yeux; 84,4 %). Les complications moins fréquentes comprenaient la sidérose oculaire et le décollement de la rétine s'accompagnant d'une vitréorétinopathie proliférante (chacune ayant touché 1 úil; 3,1 %). Enfin, un glaucome secondaire est apparu dans 4 yeux (12,5 %), dont 3 où le CEIO était demeuré en place ou avait été extrait tardivement.

Conclusions: Les caractéristiques des CEIO et les paramètres démographiques des patients cadrent avec ceux d'autres régions. La TAO était l'outil d'examen le plus efficace. On recommande un suivi prolongé pour surveiller les complications, surtout en cas de rétention du CEIO ou lorsque son extraction est significativement retardée.

Intraocular foreign bodies (IOFBs) are a significant cause of visual morbidity,[1] comprising 29% of all open globe injuries in a recent large multicentre study.[2] IOFBs primarily affect individuals aged 20–40 years and pose a challenge for ophthalmologists because of the varied intraocular pathology and visual outcomes. Factors such as composition, injury mechanism, and anatomic location within the eye can significantly influence the complexity of clinical and surgical

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management.[3] Surgical removal of an IOFB can be unpredictable and may be complicated by factors such media opacity, endophthalmitis, retinal detachment (RD), and metallosis.[4]

The composition of IOFBs has been shown to vary depending on geography and patient demographics. Young- to middle-aged men, often involved in workplace injuries, comprise most patients.[1,2,5–8] Metal-containing IOFBs are the most common (55%–100%), followed by glass (1.8%–17.6%).[1,2,5–9] A regional Australian retrospective study of 40 IOFB patient cases demonstrated that wood was present in 30% of IOFB cases, challenging the perception of its rarity.[5] These regional differences carry significant implications for the assessment and management of injuries, particularly regarding the range of potential complications, the appropriate choice of imaging modalities, and definitive management.[2–9]

The accurate determination of size and material can be critically important in selecting the most appropriate imaging modality, as misdiagnoses are a frequent source of legal disputes.[10] Various imaging modalities, such as x-ray, computed tomography (CT), bright scan (B-scan) ultrasonography, and magnetic resonance imaging (MRI) can be used. Although CT scans offer high sensitivity and resolution, they have been shown to miss small wood or glass IOFBs.[11] MRI can detect small IOFBs but is contraindicated for magnetic metallic objects.[1] B-scans provide a low-radiation alternative, but their sensitivity can be operator-dependent.[11] Therefore, it is essential to consider the patient's clinical history and the specific trends observed in local cases when determining the initial work-up and imaging approach.

The timing of IOFB removal is an important variable in patient management, yet a clear consensus on the relationship between time to removal and outcomes remains debated. Some reports suggest that immediate or early removal (<24 hours) may reduce the risk of endophthalmitis,[12,13] proliferative vitreoretinopathy (PVR), and the need for subsequent surgery.[14] Conversely, other studies propose that delayed removal, depending on the composition and nature of the injury, may not be associated with as high a complication rate as previously believed and could even facilitate an easier vitrectomy and IOFB removal.[15,16] This lack of complications has been proposed to relate to timely closure of the primary globe injury and the prompt administration of broad-spectrum antibiotics.[1] Studies report varied management approaches and clinical outcomes on the basis of the composition and the location of the IOFB, with many studies derived from military settings, in which traumatic metallic injuries represent most cases.[11–18]

To date, limited Canadian studies have examined local trends concerning patient assessment and management of IOFB injuries. This study aims to provide important characterization and detailed examination findings of injuries sustained in an urban Canadian setting. It seeks to analyse patterns and outcomes in the assessment and treatment of patients and compare these findings with studies conducted in other settings.

Methods

A retrospective chart review was conducted on all patients who were clinically or surgically followed for an IOFB by a single surgeon (A.K.) at the Calgary Retina Consultants between January 2002 and January 2023. All patient data were anonymized. This study was conducted in accordance with the Declaration of Helsinki and approved by the Health Research Ethics Board of Alberta (CHC-20-0062).

Data collection

Demographic data, initial clinical investigations, IOFB characteristics (material, size, entry site, final anatomical location), injury mechanism, interventions, associated injuries/complications, and initial and final best-corrected visual acuity (BCVA) were collected and analyzed. BCVA measurements were taken at the time of IOFB identification and during the last clinical follow-up, using a physical examination and Snellen chart. BCVA scores were categorized into 5 levels on the basis of ocular trauma scores,[19] with 20/40 or better representing the greatest score and no light perception (NLP) representing the lowest.[18] A good visual outcome was defined as having a BCVA of 20/40 or greater, whereas a poor visual outcome was indicated by a BCVA of less than 20/200.[8,15,20] Snellen eye chart measurements were converted to the logarithm of the minimum angle of resolution for statistical analysis. For BCVA worse than 20/200, the following values were assigned: 2.0 for counting finger, 2.3 for hand motion, 2.6 for light perception (LP), and 2.9 for NLP.[20]

The size, material, and final anatomic location were based on review of pathology reports, operative reports, imaging, clinical assessment, and direct examination by the authors. Representative pathology samples are highlighted in Fig. 1.

Statistical analysis

Univariable analysis of categorical variables was performed using a 2-tailed Fisher exact test. Statistical analysis was performed using SPSS, version 28.0 (SPSS, Chicago, IL), and statistical significance was set as $P < 0.05$.

Results

Patient demographics and IOFB characterization

The baseline demographics, IOFB characterization, and mechanism of injury are summarized in Table 1. This study included 32 eyes from 31 patients diagnosed with an IOFB, which was either surgically extracted or retained within the eye. The study consisted of 30 male and 1 female subject,

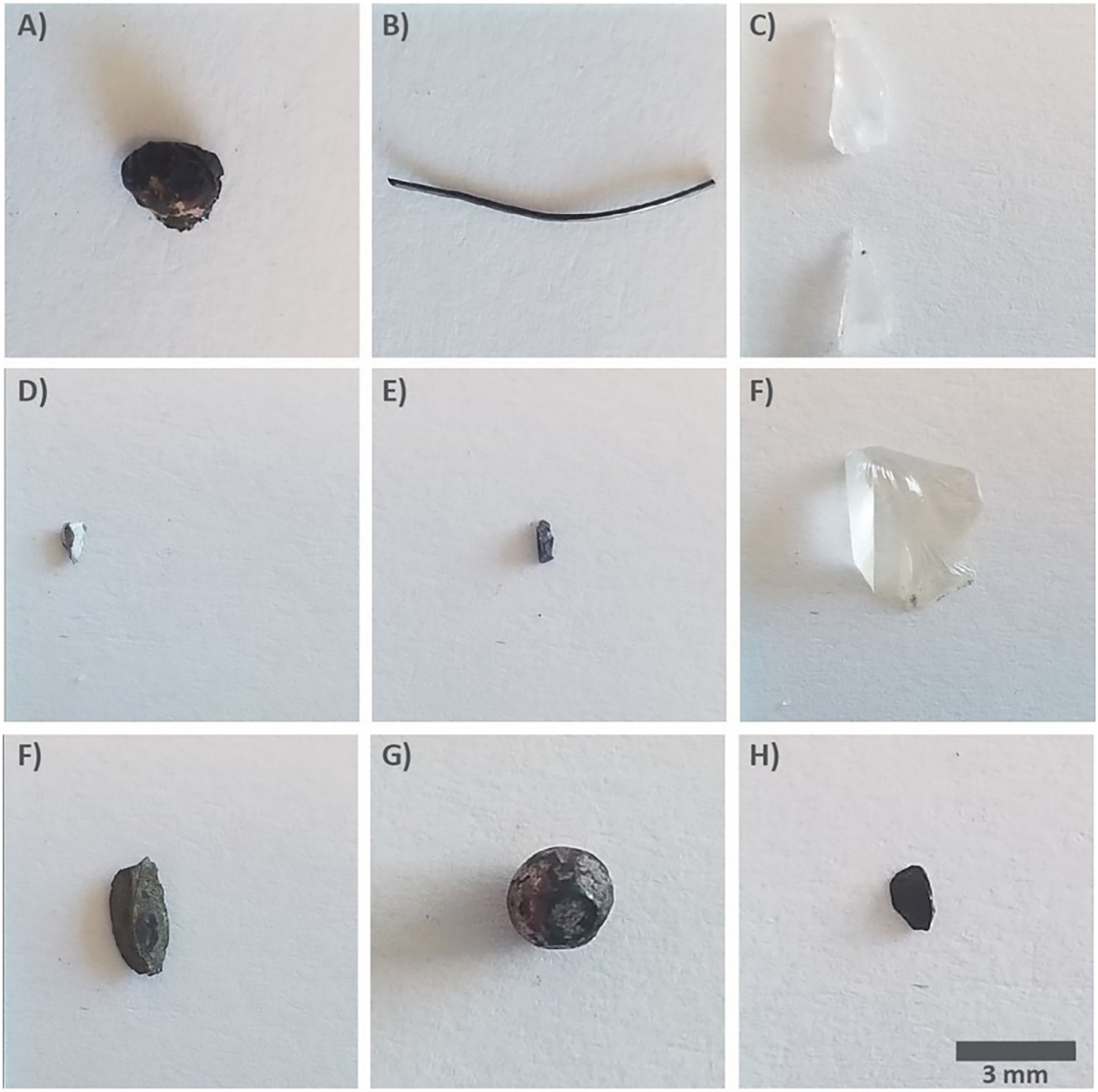

Fig. 1—Colored micrographs (A-H) of pathology samples from extracted intraocular foreign bodies, illustrating the diversity in shape, size, and material.

with a median age of 32 years (14−71). The median follow-up duration was 388 days (4−6413). Of the 32 eyes, 27 (84.4%) presented with a single IOFB, whereas 5 (15.6%) had multiple IOFBs. Among the IOFBs, 25 (78.1%) were magnetic metallic, 4 (12.5%) were nonmagnetic metallic, 2 (6.3%) were glass, and 1 (3.1%) was wood. The most common mechanism of injury was hammering and grind/machine injuries, accounting for a combined 18 cases (56.3%). Work-related injuries comprised 15 of the 32 affected eyes (46.9%).

Sizes ranged from 1.5 to 12 mm, with the cornea as the main site of ocular penetration in 21 of 32 eyes (65.6%). Of the 5 cases with multiple IOFBs, 3 eyes had them in both the anterior and posterior segment, 1 eye had multiple all within the posterior segment, whereas 2 eyes had them in the globe and orbit. The posterior-most injury locations were the retina in 1 case, the orbit in 1 case, and the vitreous in the remaining 3 cases. The final anatomical location of single IOFBs was the posterior segment in 18 of 32 eyes and the anterior segment in 5 of 32 eyes.

Initial imaging and investigations

The most common initial imaging modalities were CT scans and B-scan, as shown in Table 2. CT scans were performed in 19 patients (61%) for diagnosis, whereas B-scan was used in 8 patients (26%). Specifically, CT scans were used in 3 of 5 (60%) anterior segment cases and in 10 of 18 (55.6%) posterior segment cases. B-scan imaging was used in 1 of 5 anterior segment cases (20.0%) and 6 of 18

Table 1—IOFB baseline demographics, characterization, and mechanism of injury

Variable*	Result
Number of cases	
Patients (eyes)	31 (32)
Age, y	
Median (range)	32 (14–71)
Sex	
Male/female	30/1
Follow-up duration, d	
Median (range)	388 (4–6413)
Injury mechanism	
Hammering	9 (28.1%)
Grind/machine injury	9 (28.1%)
Blast injury	3 (9.4%)
Gunshot injury	3 (9.4%)
Miscellaneous†	4 (12.5%)
Unknown	4 (12.5%)
Material	
Metallic (magnetic)	25 (78.1%)
Metallic (nonmagnetic)	4 (12.5%)
Wood‡	1 (3.1%)
Glass	2 (6.3%)
Number of IOFB	
Single	27 (84.4%)
Multiple	5 (15.6%)
Work-related injury	
Yes	15 (46.9%)
No	17 (53.1%)
Size, mm	
Range	1–12
Median	3
Entry site	
Cornea	21 (65.6%)
Sclera	9 (28.1%)
Limbus	1 (3.1%)
Not visualized	1 (3.1%)
Final location	
Anterior segment	5 (15.6%)
Posterior segment	18 (56.3%)
Orbit	4 (12.5%)
Multiple locations	5 (15.6%)

IOFB, intraocular foreign body.
*All proportions are presented as percentage of the total eyes (n = 32).
†Miscellaneous include injuries with bungee cord, floorboards, driving and planting.
‡Patient with multiple IOFB, including metal material and an eyelash.

(33.3%) posterior segment cases. Examples of the diagnostic imaging are illustrated in Fig. 2.

Visual acuity

The presenting BCVA was available for 30 eyes, and the final BCVA was available for all 32 eyes, as detailed in Table 3. On presentation, the BCVA was greater than or equal to 20/40 in 7 eyes (23.3%), between 20/40 and 20/200 in 8 eyes (26.7%) and worse than 20/200 in 15 eyes (50%). At the final follow-up visit, the BCVA was greater than or equal to 20/40 in 17 of 32 eyes (53.1%), between 20/40 and 20/200 in 7 eyes (21.9%), and worse than 20/200 in 8 eyes (25.0%).

The changes in the BCVA among patients with different presenting BCVA are illustrated in Fig. 3. Among the 30 eyes, 23 (76.7%) demonstrated improvement, 3 (10.0%) remained the same, and 4 (13.3%) had a decrease in their final BCVA compared with their presenting BCVA. Of the 15 patients with a BCVA worse than 20/200, 13 patients (86.7%) experienced improvement, whereas 2 patients (13.3%) experienced a deterioration in their final BCVA. Notably, patients with an initial BCVA of 20/200 or better were significantly more likely to achieve a final BCVA of 20/40 or better ($P = 0.027$).

Table 2—Proportion of initial imaging modalities used before surgical intervention

Imaging modality	Use as initial diagnostic imaging
CT	19 (61.3%)
B-scan	8 (25.8%)
X-ray	2 (6.5%)
No imaging	2 (6.5%)

Total patients (n) = 31.
CT, computed tomography; B-scan, bright-scan ultrasonography.

Surgical intervention and management

Initial surgical interventions are outlined in Table 4. Among the 32 eyes, 27 (84.4%) IOFBs were extracted, 4 (12.5%) were retained, and 1 (3.1%) eye required enucleation upon presentation. Most extractions were completed promptly, with 20 of 27 being removed within the first 24 hours of presentation. As detailed in Table 4, repair of IOFB entry wounds was necessary in a minority of cases, with 14 eyes (44%) requiring scleral or corneal laceration repairs. Specifically, 6 of 9 (67%) cases with scleral entry wounds required laceration repairs, whereas 8 of 21 (38%) with corneal entry wounds required repairs. During the initial surgery, lens removal was completed in a total of 17 eyes (53%).

Intravitreal antibiotics were administered to 19 of the 32 eyes (59.4%), but 1 patient experienced decreased BCVA as the result of presumed antibiotic toxicity. Additional surgeries were performed in 19 of 32 eyes (59.5%) for various reasons, including RD repair and secondary lens implantation.

Associated injuries and complications

Complications were observed in 30 of 32 eyes (93.8%). A summary of complications and associated injuries is presented in Fig. 4. Among the 119 complications, 72 (60.5%) occurred within the first 24 hours, whereas 47 (39.5%) were delayed beyond 24 hours. The most frequently occurring complications among the 32 eyes studied were traumatic cataracts (TCs) in 27 (84.4%) eyes and vitreous haemorrhages (VHs) in 15 eyes (46.9%). The least common complications included siderosis, proliferative vitreoretinopathy, and presumed antibiotic drug toxicity, each occurring in 1 eye (3.1%). All 9 cases of epiretinal membranes (ERM) and 4 of the 10 cases of RD occurred more than a month after the injury. In 8 of 10 (80%) retinal tear cases, isolated tears did not progress to subsequent RD. All retinal tear cases were treated with endolaser demarcation after identification. Secondary glaucoma was present in 4 cases: 2 in cases of from delayed IOFB extraction beyond 1 year, 1 in case of a retained IOFB, and the last from an extraction within 24 hours.

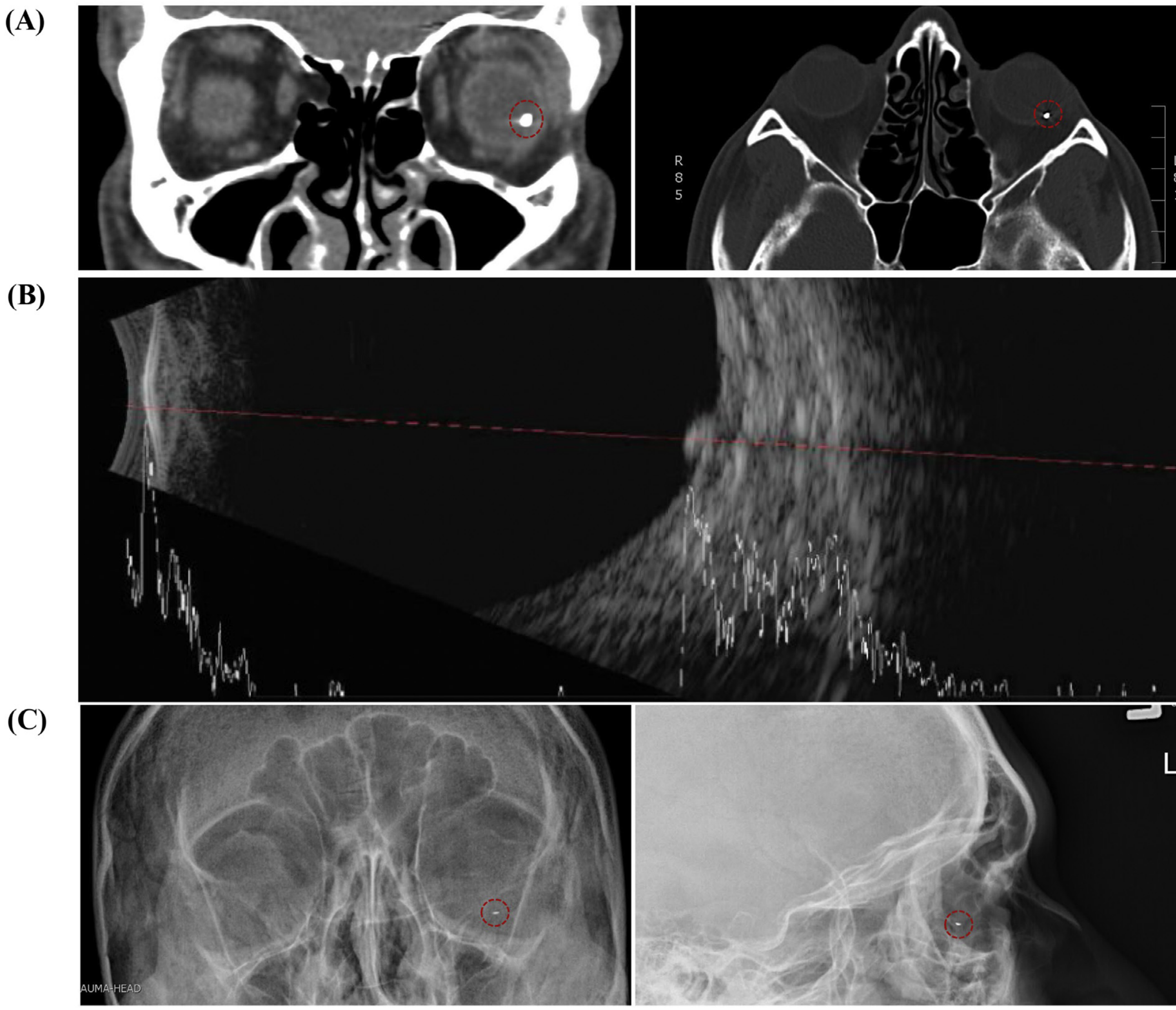

Fig. 2—Diagnostic imaging of IOFB. (A) CT of a 3-cm IOFB in the temporal macula of the retina. (B) B-scan of a 1.5-mm IOFB in the inferotemporal retina. (C) X-ray of 3-mm IOFB in the temporal macula. IOFB, intraocular foreign body; CT, computed tomography; B-scan is bright-scan ultrasonography.

Discussion

Patient demographics and IOFB characterization

The younger average age, greater proportion of male patients, and greater incidence of metallic IOFBs in this study align with findings reported from the United States,[3,9,14,17] Asia,[2,8,12,15,20] Europe,[6,7,21,22] and Canada.[23] In this study, hammering comprised 28.1% of all injuries whereas other studies reported a range of 32.7%–80%.[1–3,6,12,20] Weapon-related injuries accounted for 19% of cases in the United States, whereas this study found them to represent 9.4% of the cases.[1]

Work-related injuries accounted for 46.9% of cases in this study, which is near the lower range of 50.4%–96.4% reported from other regions.[2,3,7–9,12,20] In a Romanian case series, an even lower percentage of 7.1% was reported among 56 cases, which the authors attribute to the local safety and labour regulations.[21] Overall, studies have indicated low compliance rates (0%–10.5%) regarding the use of protective eyewear.[2,3,12,21]

Table 3—Summary of BCVA for total eyes upon presentation and final patient follow-up

BCVA measured range	Presenting BCVA* (N = 30)	Final BCVA (N = 32)
≥20/40	7 (23.3%)	17 (53.1%)
20/50 to 20/200	8 (26.7%)	7 (21.9%)
<20/200 to CF	3 (10.0%)	5 (15.6%)
HM or LP	10 (33.3%)	1 (3.1%)
NLP	2 (6.7%)	2 (6.3%)

BCVA, best-corrected visual acuity; CF, counting finger; HM, hand motion; LP, light perception; NLP, no light perception.
*Two BCVAs at presentation could not be accurately obtained because of inadequate documentation.

Initial imaging and investigations

Imaging choice varies by cost, accessibility, and diagnostic yield. X-rays are effective for metal IOFBs but may miss

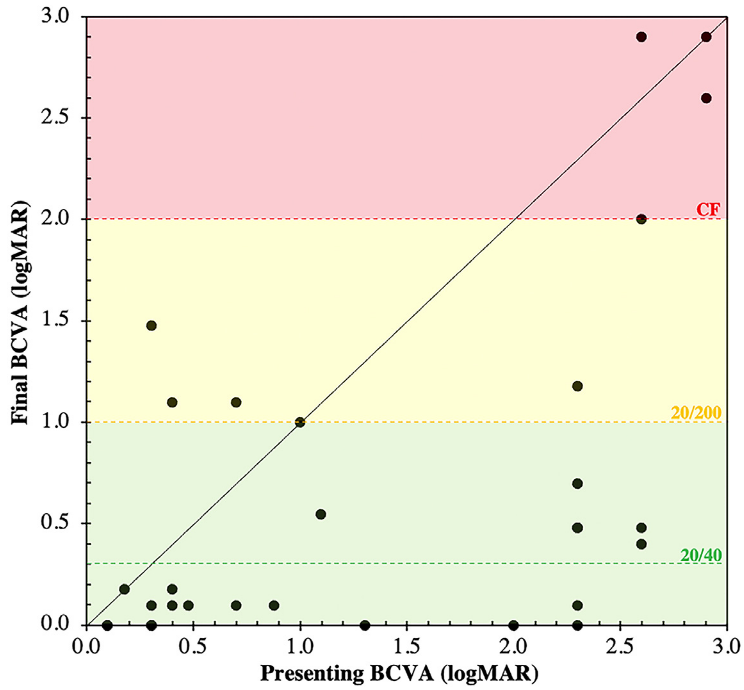

Fig. 3—Scatter plot of the presenting and final BCVA for each respective eye. Points on the diagonal line represent no change in BCVA, points above the line represent a decrease in BCVA, and points below the line represent an improvement in BCVA. Total eyes (n) = 30, with some (n = 3) having the same initial and final BCVA. BCVA, best corrected visual acuity; logMAR, logarithm of the minimum angle of resolution.

Table 4—Summary of IOFB extraction and related surgical interventions completed on initial presentation

Surgical procedure	Time to extraction			
	(<24 h) (N = 20)	(>24 h) (N = 7)	Retained (N = 5)*	Total (N = 32)
Vitrectomy	17 (85%)	7 (100%)	2 (40%)	26 (81%)
Scleral laceration repair	6 (30%)	0 (0%)	0 (0%)	6 (19%)
Corneal laceration repair	6 (30%)	2 (29%)	0 (0%)	8 (25%)
Scleral buckle	2 (10%)	0 (0%)	0 (0%)	2 (6%)
Laser demarcation/retinopexy	15 (75%)	5 (71%)	2 (40%)	21 (66%)
Lateral rectus muscle repair	2 (10%)	0 (0%)	0 (0%)	2 (6%)
Anterior chamber washout	5 (25%)	0 (0%)	1 (20%)	6 (19%)
Enucleation	0 (0%)	0 (0%)	1 (20%)	1 (3%)
Lensectomy	10 (50%)	5 (71%)	2 (40%)	17 (53%)

IOFB, intraocular foreign body.
*Includes case of enucleation for an eye that could not be salvaged.

nonmetal ones.[24,25] CT scans have greater resolution but can miss wood, glass, or aluminium.[25–28] B-scans are cost-effective and useful for glass and plastic but are operator-dependent and limited in open globe injuries.[25,29] MRI offers the highest sensitivity for detecting occult and nonmetallic IOFBs but is contraindicated for metallic IOFBs and less accessible in Canada.[25,30]

In this study, CT scans and B-scans were the primary imaging modalities for 87% of patients. CT scans demonstrated 100% sensitivity, whereas B-scan missed a 2-mm metallic IOFB, resulting in an 88% detection rate. This aligns with Bryden et al.'s 88% B-scan detection rate and surpasses the 69%–90% sensitivity reported in x-ray imaging for metallic IOFBs.[24,25,31] Interestingly, CT scans can exhibit a sensitivity as low as 43% for certain glass materials[27] and 75% for wood,[32] highlighting the importance of B-scan as an additional investigative tool.[26,31]

Visual acuity and complications

Multiple studies have consistently demonstrated that the initial visual acuity is a crucial prognostic factor of the final visual outcome.[6,8,15,20,33–35] In this study, patients with a baseline BCVA of 20/200 or better had a greater likelihood of achieving visual recovery to 20/40 or better ($P = 0.027$).

Studies have reported high rates of TC and VH ranging from 78% to 82 % and 47% to 82%, respectively.[18,33,35] In this study, TC occurred in 84% of eyes, and VH in 47%. However, the role of these complications as significant prognostic indicators for a poor visual outcome (BCVA

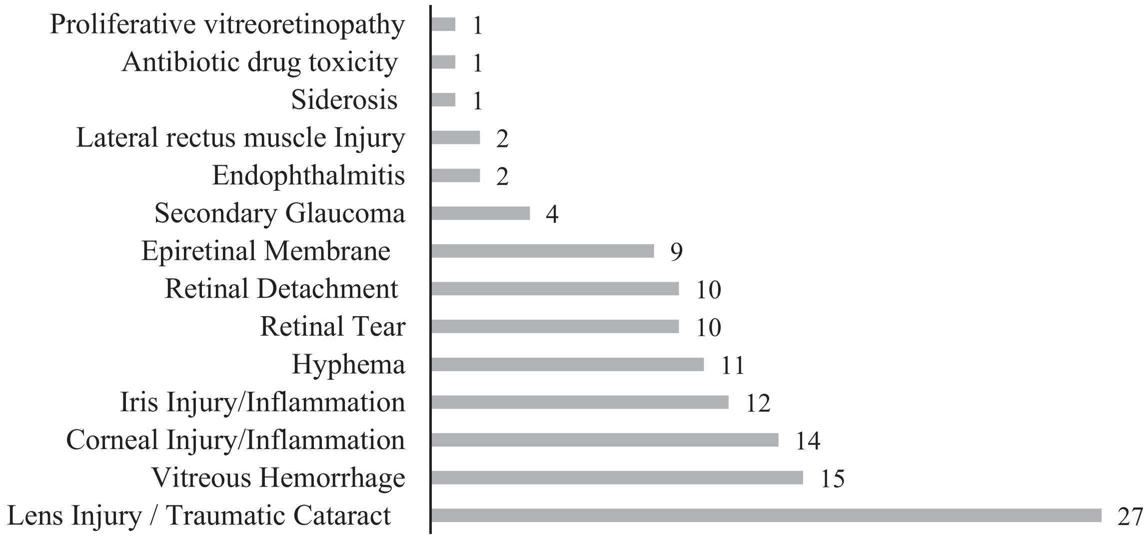

Fig. 4—Frequency of complications and associated injuries in eyes presenting with an IOFB (n = 32). IOFB, intraocular foreign body.

<20/200) has varied among studies.[7,15,20,21,23,33–35] Less-common complications were siderosis, antibiotic drug toxicity, and RD with PVR, and each occurred only in 1 eye (3%). Siderosis, although rare, was previously reported at a frequency of 2.7%.[33] Retinal toxicity has been observed in silicone oil-filled eyes when regular doses of intravitreal antibiotics, like vancomycin and ceftazidime, were administered.[36] This is believed to result from reduced drug elimination, leading to a recommendation of using 25% of the recommended dose when silicone oil is present.[36,37] Intraretinal IOFBs are associated with an increased incidence of ERM and PVR.[38,39] PVR, associated with poor visual outcomes, varies from 2.41% to 26.51%.[18,35] Although PVR was uncommon in this study, ERM was found in 28% of eyes. Intraretinal IOFBs have a reported ERM occurrence rate ranging from 29% to 36%.[38,39] All ERM cases in this study occurred more than 1 month after the injury, highlighting the importance of extended follow-up.

Two cases (6.25%) of endophthalmitis were observed, consistent with reported ranges of 0%–30% in other studies, with an average of 6.5%.[17,32,33] Protective factors against endophthalmitis include primary repair within 24 hours of injury, self-sealing initial injury site, and the use of preoperative and postoperative antibiotics.[2,4,16] The effect of endophthalmitis on final visual acuity varies, with some studies[33,35] showing an association with poor outcomes and others not.[23,40] Although the sample size of endophthalmitis cases in this study is limited, both cases were not associated with poor visual outcomes (final BCVA of 20/25 and 20/20). A study of 77 IOFB injuries attributed their low incidence of endophthalmitis (0%) to the institution's practice of administering broad-spectrum IV antibiotics for 48 hours.[32] Further studies exploring endophthalmitis rates in relation to Canadian institutional antibiotic administration protocols could prove beneficial.

Implications of delayed and retained IOFB

Delays in removals beyond 24 hours are associated with an increased risk of endophthalmitis and PVR,[4,13,16,18] and removals beyond a year an increased the risk secondary glaucoma.[33] Interestingly, none of the delayed extractions in this study resulted in cases of PVR or endophthalmitis. However, both cases with delays exceeding 1 year developed secondary glaucoma.

In the 4 cases of retained IOFBs, only one developed secondary glaucoma, and initial BCVA varied. In 3 cases, the IOFB perforated into the retroorbital space near the optic nerve, making extraction technically challenging. Among these cases, 2 experienced improvements in vision (LP to counting finger and 20/250 to 20/70), and 1 declined (LP to NLP). The one remaining case presented 18 months after injury with an IOFB in the inferonasal pars plana, maintaining a stable BCVA of 20/30 during the 6.5-year follow-up. This suggests that initial visual acuity remains an important prognostic factor in retained IOFBs, although further studies are needed to confirm this relationship. In cases in which removal poses a risk of significant damage to an eye with good visual acuity and no signs of endophthalmitis, it is recommended to opt for regular follow-up with visual acuity and imaging studies instead.[41]

Conclusions

This study provides insights into urban Canadian IOFB injuries, which predominantly affected younger male patients, with most being nonwork-related injuries. CT scans effectively detected IOFBs in all cases; however, B-scans were a cost-effective alternative for detecting glass and metallic material without ionizing radiation. An initial BCVA ≥20/200 was found to be significantly associated with a good visual outcome. Most IOFBs had associated injuries and complications, with TC being common and siderosis less common. Delayed complications included ERM and RD with PVR, for which extended follow-up is recommended for appropriate identification. Similarly, in retained or delayed IOFB removal, long-term monitoring is recommended to monitor for the development of secondary glaucoma. Lastly, the study highlights the increased risk of retinal toxicity when using silicone oil in the presence of intravitreal antibiotics, such as vancomycin and ceftazidime. The reduced drug elimination due to the presence of silicone oil necessitates adjustments to the recommended dosage to mitigate the risk of toxicity.

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Footnotes and Disclosure

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