## Consent for Publication

The patient's parents gave verbal permission for the presentation of clinical details and images in this study. This report does not contain any personal information that could lead to the identification of the patient.

## Supplementary Materials

Supplementary material associated with this article can be found in the online version at doi:10.1016/j.jcjo.2020.09.005.

**Kevin Mairot, Prithvi Ramtohul, Pierre Gascon, Alban Comet, Danièle Denis**
Centre Hospitalier Universitaire de l'Hôpital Nord, Marseille, France.

*Correspondence to:*
Kevin Mairot, MD: kevinmairot@gmail.com.

## References

1. Ferner RE, Huson SM, Thomas N, et al. Guidelines for the diagnosis and management of individuals with neurofibromatosis 1. J Med Genet 2007;44:81–8.
2. Shields JA, Shields CL, Honavar SG, Demirci H, Cater J. Classification and management of Coats disease: the 2000 Proctor Lecture. Am J Ophthalmol 2001;131:572–83.
3. Parrozzani R, Pilotto E, Clementi M, Frizziero L, Leonardi F, Convento E, et al. Retinal vascular abnormalities in a large cohort of patients affected by neurofibromatosis type 1: A Study Using Optical Coherence Tomography Angiography. Retina (Philadelphia, Pa) 2018;132:585–93.
4. Shields JA, Pellegrini M, Kaliki S, Mashayekhi A, Shields CL. Retinal vasoproliferative tumors in 6 patients with neurofibromatosis type 1. JAMA Ophthalmol 2014;132:190.
5. Zhang H, Hudson FZ, Xu Z, et al. Neurofibromin deficiency induces endothelial cell proliferation and retinal neovascularization. Invest Ophthalmol Vis Sci 2018;59:2520–8.
6. Chiu SL, Chen SN, Chen YT, Chen PJ. Coats' disease and neovascular glaucoma in a child with neurofibromatosis. J Pediatr Ophthalmol Strabismus 2011;48:e1–3.

## Footnotes and Disclosure

The authors have no proprietary or commercial interest in any materials discussed in this article.

# Late-onset spontaneous EX-PRESS shunt dislocation into anterior chamber

The EX-PRESS Glaucoma Filtration Device (Alcon Laboratories, Fort Worth, Tex) is a surgical option for management of uncontrolled open-angle glaucoma where medical and laser treatments have failed. It is a stainless steel, nonvalved device that is implanted under a scleral flap and secured by sutures. By using this surgical approach, the complications of erosion of overlying conjunctiva and shunt extrusion are reduced, and similar efficacy and safety, when compared with trabeculectomy, has been shown.[1] Even though it is influenced by magnetic field forces, magnetic resonance imaging (MRI) is considered safe in patients with EX-PRESS shunt.[2,3] We present a case of late-onset spontaneous EX-PRESS dislocation into the anterior chamber, coincidentally after a positron emission tomography–computed tomography (PET-CT) scan.

A 70-year-old Hispanic man being followed and treated for primary open-angle glaucoma presented with sudden pain and decreased vision in his right eye. Two years earlier he had underwent EX-PRESS P-50 model shunt insertion by our group in both eyes with a 2-month span, without any complications, due to severe visual field deterioration despite maximal topical hypotensive therapy. His medical history was relevant for prostate cancer in remission for 2 years. As part of follow-up, a PET-CT (Biograph mCT, Siemens, Siemens Health Care, Erlangen, Germany) scan was performed 2 weeks before the onset of ocular pain.

During consultation, examination revealed a best-corrected visual acuity of 20/40 in the right eye and 20/20 in the left eye with an intraocular pressure (IOP) of 12 and 14 mm Hg, respectively. The patient denied any history of trauma, rubbing, cough, or Valsalva manoeuvres. The biomicroscopy of the right eye showed mild conjunctival injection, a low diffuse bleb, and a localized corneal edema. The whole EX-PRESS shunt was noted to lie inferiorly in the anterior chamber angle (Fig. 1).

The patient was taken to the operating room, and the EX-PRESS shunt was removed via a 2.2 mm clear corneal incision assisted by ophthalmic viscosurgical devices and straight toothed 0.12 mm forceps, without complications or incidents (Fig. 2). On postoperative day 1, his vision was 20/30 and IOP 14 mm Hg without any topical medications, no corneal edema, and minimal anterior chamber reaction, which was controlled with topical steroids. One month after the surgery, his visual acuity was 20/20, IOP was 14 mm Hg, a mild iris atrophy in the sector of the wound was found, and the specular microscopy revealed a cell count of 1815 within normal morphology.

The EX-PRESS shunt was designed as an alternative to trabeculectomy with less complications for patients with open-angle glaucoma in which medical therapy has failed. It is made of stainless steel, which is an inert material and compatible with MRI. Implanting the device under a scleral flap has reduced the possibility of movement of the device and conjunctival exposure.

Coincidentally, our patient underwent PET-CT scan 2 weeks before the EX-PRESS dislocation. PET-CT is a nuclear imaging test in which a radiolabeled molecule enables functional imaging of a metabolic pathway. It has

**Fig. 1—Gonioscopic view of EX-PRESS shunt in the inferior angle.**

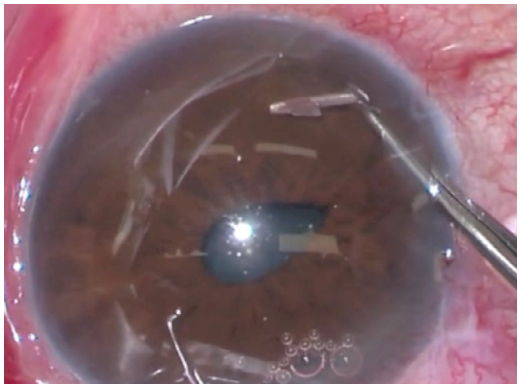

**Fig. 2—Intraoperative image showing EX-PRESS minishunt removal using 0.12 mm forceps.**

mainly been applied in cancer imaging. The most common radioactive substance used in PET is fluorodeoxyglucose, which emits gamma rays that are detected by the scanner. There are no absolute contraindications for a PET scan because only small amounts of radiation are given, in fact less than those given for a diagnostic CT scan.[3] In general, patients with metallic implants, pacemakers, prostheses, or other devices can safely undergo a whole-body PET scan. The only adverse effect of metallic devices is that they can cause fluorodeoxyglucose uptake around them, and this could simulate inflammation.

There is a previous report of dislocation into the anterior chamber only in the early postoperative period, explained by the use of a wider-gauge needle to perforate the anterior chamber, the early laser suture lysis, and bleb massage; all of these factors may have contributed to migration of the external surface plate of the EX-PRESS implant.[4]

In our case, the dislocation of the EX-PRESS after PET-CT was probably coincidental, because there was not documented exposure to a magnetic field, and a PET-MR or MRI was ruled out. Also, the patient had routine PET-CT scans every 6 months. Nevertheless, the potential risk of ocular injury secondary to metallic implants and devices moving during exposure to magnetic field must be addressed. Although the EX-PRESS shunt does not exhibit ferromagnetic properties, attention must be paid to inadvertent exposure, and counseling must be given to patients having the device implanted, as the device would emulate an orbital foreign body. Although previous literature is scant, apparently 1.5 and 3 T could be safe for imaging in patients with EX-PRESS shunt device.[3]

Metallic foreign bodies in the anterior chamber can compromise visual acuity and final visual prognosis, and thus the decision was to remove the EX-PRESS shunt in the operating room immediately. The final result in this case was favourable, only showing a mild iris atrophy (Fig. 2A), despite the fact that there are some reports of other (nonmetallic) types of glaucoma devices shifting into the anterior chamber.[5] To our knowledge, there are no previous reports of late-onset presentation of EX-PRESS dislocation not related to the surgical technique. The importance of this case is to make the glaucoma specialist aware that EX-PRESS late-onset dislocation into the anterior chamber is a plausible complication.

**Jasbeth Ledesma-Gil,* Carlos Alvarez-Guzman,* Alejandro Navas,* Ike Ahmed†**
*Institute of Ophthalmology "Conde de Valenciana," Mexico City, Mexico; †University of Toronto, Toronto, Ont.

Originally received Jan. 10, 2020. Accepted Jul. 9, 2020.

Correspondence to:
Jasbeth Ledesma-Gil, MD;
jasbeth.ledesma@institutodeoftalmologia.org.

## References

1. Shaarawy T, Goldberg I, Fechtner R. EX-PRESS glaucoma filtration device: review of clinical experience and comparison with trabeculectomy. Surv Ophthalmol 2015;60:327–45.
2. Geffen N, Trope GE, Alasbali T, Salonen D, Crowley AP, Buys YM. Is the Ex-PRESS glaucoma shunt magnetic resonance imaging safe. J Glaucoma 2010;19:116–8.
3. Mabray MC, Uzelac A, Talbott JF, Lin SC, Gean AD. Ex-PRESS glaucoma filter: an MRI compatible metallic orbital foreign body imaged at 1.5 and 3T. Clin Radiol 2015;70 e28–34.
4. Teng CC, Radcliffe N, Huang JE, Farris E. Ex-PRESS glaucoma shunt dislocation into the anterior chamber. J Glaucoma 2008;17:687–9.
5. Dervenis N, Mikropoulou AM, Dervenis P, Lewis A. Dislocation of a previously successful XEN glaucoma implant into the anterior chamber: a case report. BMC Ophthalmol. 2017:17:148.

## Footnotes and Disclosure

The authors have no proprietary or commercial interest in any materials discussed in this article.