Keywords: Blade; Head of a Dog; Surgery; Medications

Introduction

For needle removal surgery, an 8-year-old Maltese dog was referred to the Fuziovet Veterinary Referral Clinic and Hospital (Budapest, Hungary). e dog had a cluster seizure three days prior to the referral and had been involved in a small car accident. A nearby veterinarian took care of this, and oral phenobarbital was started as a long-term epilepsy treatment. e dog was recommended for a brain MRI test to [1-6] look at the potential underlying cause of the epilepsy. e neurological evaluation did not reveal any anomalies at the time of referral. Blood and urine tests, stomach and cardiac ultrasounds, and chest x-rays were routine preoperative examinations.

Materials &Methods

Investigations

Metal was detected during scout imaging utilising a 1.5 T MRI (Siemens Magnetom Avanto, Siemens, Erlangen, Germany) scanner. e dog was moved from the MRI to a CT scanner (Siemens Somatom Sensation Cardiac CT, Siemens, Erlangen, Germany), which revealed an object with the appearance of a needle in the right side of the skull. is penetrated the bone and the temporal cortex and was situated rostral and medially to the temporomandibular joint at the lateral-most margin of the ala ossis basisphenoidalis (Figure 1). Additionally, somewhat dilated lateral ventricles were seen. e [7-10] squama temporalis, which is located in the middle ectosylvian gyrus, halted the needle's tip dorsally. It's interesting to note that the owner couldn't recall any prior clinical evidence of needle swallowing. e dog never displayed any symptoms of mouth bleeding, decreased appetite, or oral pain.

Learning points/take-home messages

Even though it involves an additional step and costs more money, a doctor should consider a routine skull x-ray before sending a patient for a brain MRI if there is a suspicion of an intracranial foreign body. is is because it has been shown that not all animals with intracranial metallic foreign bodies exhibit clinical symptoms. Due to the magnetic eld's action on the object in their case—especially a high- eld magnetic resonance imaging—it could cause iatrogen trauma. Computed tomography testing is preferred if the x-ray shows that a metallic object is present. It may be su cient in some circumstances to determine the disease's origin and to make therapeutic options (e.g., conservative or surgical method). Additionally, it can be assessed how deeply the object is entrenched in the surrounding tissues or whether it is situated in a location where it is most likely to interact with the region of interest of a future magnetic resonance research. Low- eld magnetic resonance imaging can be used if the computed tomography imaging results are insu cient (e.g., if further details need to be collected from the intracranial environment). Before doing the magnetic resonance scanning, a detailed cost-bene t analysis must be done because both the veterinarian and the owner should be aware of the potential risks. Preoperative planning for the surgical procedure should include both a decision tree outlining the potential surgical approaches and a three-dimensional visualisation of the a icted area to better comprehend the relationships (e.g., if the rst route of intervention has to be changed intraoperatively, one should have an instant plan B to continue with). It should be highlighted that not all intracranial foreign objects can or should be removed based on case reports from human medicine. us, we emphasise the signi cance of multidisciplinary discussion and decision-making to select the most appropriate (conservative or surgical) approach for a particular instance.

Di erential diagnosis

Seizures were the primary symptom in this case, which can be caused by structural brain damage from in ammation, tumours, congenital brain malformations, trauma, or secondary e ects from systemic changes (reactive epilepsy); seizures can also have idiopathic causes. e lateral ventricles were found to be signi cantly enlarged on the CT scan, which can result in both epilepsy and brain damage. e metal foreign body inside the skull prevented the required MRI study from being done, thus we were unable to learn more about the brain or any potential changes brought on by head trauma. e probable (Figure 1) reasons of the symptoms were slight displacement of the foreign body due to the needle inside the brain, secondary brain damage, or trauma-related brain damage/hydrocephalus. e likelihood of an idiopathic origin was not completely ruled out, though.

Treatment

e needle detected by CT was removed from the dog at our facility. ree-dimensional (3D) reconstruction of the CT images was done prior to the operation. Using the 3D Slicer programme (https://www.slicer.org), 4 4ces 3D SlEn be useieign body inside the skull bein am

out and exported as stereolithographic (STL) les. e models were improved using the Blender programme (https://www.blender.org). e dog was placed in sternal recumbency for the procedure, and a special tool was used to hold the head in place while opening the mouth. As a premedication, injections of fentanyl (5 mg/bwkg, Richter Gedeon), dormicum (0.05 mg/bwkg, EGIS), and ketamine (CP Ketamin 10% injectable AUV, Medicus Partner) were given. Propofol (1% MCT/LCT, 5.5 mg/bwkg, Fresenius-Kabi) was used to induce anaesthesia, and iso urane and oxygen gas (1000 mg/g, 1.5 v/v%,