

# Current experience in intraocular fine needle aspiration biopsy in Mexican-Mestizo population

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## Abstract

**Background:** Since the first intraocular biopsy performed in 1868 [1] by Hirshberg and experience published by Jackobiec in 1979, fine-needle aspiration biopsy (FNAB) in the eye has been used for several intraocular tumors [2].

In developed countries there is wide experience regarding intraocular FNAB, in contrast to developing countries where this diagnostic tool has been left aside.

**Aim/Objective:** To inform the first number of cases of intraocular FNAB performed in Mexican-Mestizo patients of the retina service at the General Hospital “Eduardo Liceaga” in Mexico City.

**Material and methods:** FNAB were performed using general anesthesia. Conjunctival incision at 4 mm from limbus followed by the insertion of a 23 gauge needle attached to a syringe using a connector tubing. Aspiration of 0.10 cc of undiluted vitreous was realized. After wound closure cryotherapy was applied. Vitreous smears were performed and remaining material processed in a cell block. Preparations were stained with Hematoxylin-Eosine and Peryodic Acid Shiff and evaluated under conventional light microscopy.

**Results:** There were a total of 7 cases. The histopathological diagnosis were 2 cases of Coats’ disease, an intraocular invasive squamous cell carcinoma from the conjunctiva, ciliary body melanocytoma (magnocellular nevus), acute endophthalmitis, non Hodgkin’s lymphoma and amelanotic melanoma. Complications were one retinal detachment and a vitreous hemorrhage.

**Conclusions:** In difficult cases after the exhaustive clinical evaluation, FNAB becomes a very good choice as a diagnostic tool. In order to minimize serious potential eye complications we strongly advice intraocular FNAB to be performed by trained subspecialists and the microscopic evaluation should be interpreted by an expert ophthalmic pathologist. Although in our country there is limited experience, first results are encouraging.

## Introduction

Hirschberg performed the first intraocular biopsy in 1868 [1] then Jackobiec published his experience in 1979. Since then fine-needle aspiration (FNAB) biopsy in the eye, has been used for several intraocular tumors [2].

In underdeveloped countries this diagnostic tool has been left aside, because the fear of tumoral seeding in to the needle tract [3], the lack of technology for adequate specimen processing and accurate interpretation.

The accepted indications for intraocular FNAB are 1) Major diagnostic uncertainty, 2) Amelanotic mass in a patient with history of previous non ocular malignancy, 3) Patient refuses treatment until malignancy is confirmed, 4) Suspected re-growth following an intraocular mass, 5) Prognostication is required, 6) Patient agree to be included in a scientific study [4], 7) Amelanotic mass in a patient without history of systemic malignancy. About one third of patients with intraocular metastasis ignore they have a primary malignancy elsewhere [5]. In this group intraocular FNAB diagnosis could be useful after primary tumor is localized and treated [6]. For intraocular FNAB Shields et al. reported rates of sensitivity 100% and specificity 98% [7,8].

## Methods

According to the declaration of Helsinki, patients from the Hospital General de México “Eduardo Liceaga” retina service with clinical suspicion of intraocular malignancy and doubtful diagnosis were considered candidates for FNAB. In the presence of a potential sight or life threatening disease without a reliable diagnosis after exhaustive clinical examination, ultrasound, fluorescein angiography and computed tomography evaluation. Informed consent was explained and signed in all the cases.

FNAB was performed in the operating room (OR), keeping aseptic techniques and using general anesthesia. After topical 5% povidone iodine antiseptis conjunctiva was incised at 4 mm from the corneo-

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**key words:** fine needle aspiration biopsy, ocular oncology, ophthalmic pathology, intraocular tumor, primary tumor

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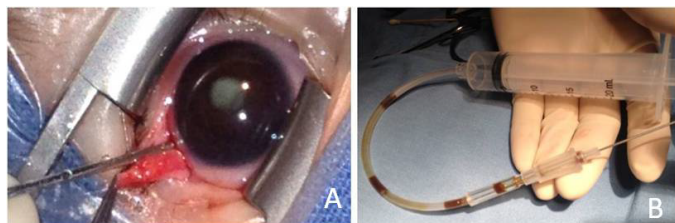
scleral limbus. A 23 gauge needle attached to a straight polyethylene connector tubing (12 inches long) to a 10 cc syringe was introduced in the sclera at ciliary body pars plana level. From the syringe 0.10 cc of undiluted vitreous was aspirated (Figure 1). Scleral and conjunctival wounds were closed with 7-00 polyglactin 910 suture (vicryl), followed by 3 spots of cryotherapy. Material from syringe was sent to ophthalmic pathology service immediately. Smears were performed and the remaining material centrifugated for cell block. After fixation in 10% formalin for 24hrs, paraffin embedded 4 microns sections were stained with Hemtoxylin- Eosine (H&E) and Peryodic Acid Shift Stain (PAS). Subsequent conventional light microscopy evaluation by ophthalmic pathologist.

## Results

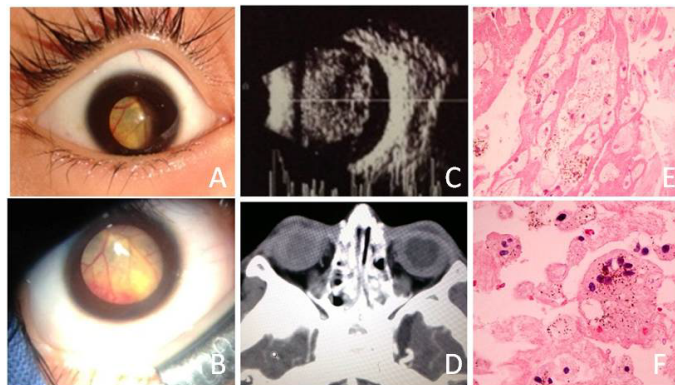
There were a total of 7 patiens that underwent intraocular FNAB. Microscopic evaluation revealed 2 cases of Coats' disease (Figure 2), and intraocular invasive squamous cell carcinoma from the conjunctiva, ciliary body melanocytoma (magnocellular nevus) (Figure 3), acute endophthalmitis, non Hodgkin's lymphoma and amelanotic melanoma. Complications were a case with retinal detachment and another with vitreous hemorrhage.

## Discussion

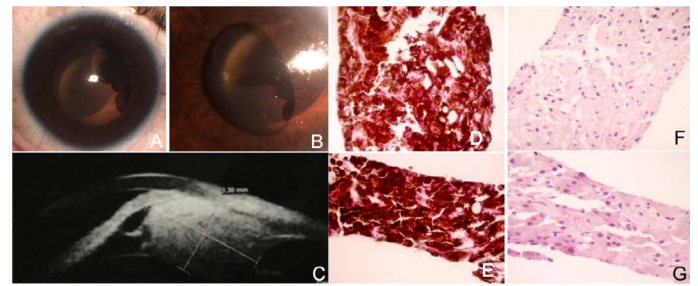
Usually clinical examination with non-ivasive techniques and image studies are enough for the diagnosis of intraocular tumors. However in some cases stablishing accurate diagnosis can be challenging, in these cases FNAB may be helpful. Samples may be obtained via anterior segment, such as aqueous tap, iris and ciliary body through iridectomy and/or iridocyclectomy, and FNAB. Factors evaluated for intraocular FNAB are location, size and clarity of ocular media<sup>9</sup>. Instrumentation in FNAB varies depending the involved tissue (aqueous choroid, subretinal space, retina, vitreous), it is not recommended for lesions less



**Figure 1.** A) Scleral needle insertion (23G) 4mm from limbus in the ciliary body pars plana B) Connector tubing and 10 cc syringe for vitreous aspiration.



**Figure 2.** A, B) OD clinical leukocoria C) Ultrasound B-Mode showing an intraocular mass with no evidence of calcification D) Axial computed tomography with OD intraocular isodense occupative mass E, F) Histopathologic features revealed numerous foamy histiocytes and absence of neoplastic cells (Coats' Disease) (H&E, x20, x40).



**Figure 3.** A, B) Pigmented mass behind the iris C) Ultrasound biomicroscopy revealed a ciliary body heterogenic mass with iris anterior displacement D, E) Histopathologic features showed heavily melanin pigmented cells (H&E 20x) F, G) Bleached sections revealed uniform bland cells with oval nuclei, no prominent nucleoli and no mitosis were seen (Melanocytoma/ magnocellular nevus) (H&E 40x).

than 2 mm of thickness. Most frequently used needles for ophthalmic FNAB are of 25–30 gauge. Thicker gauge improves the size of the sample compared to a thinner gauge needles. FNAB complications are localized transient vitreous haemorrhage (46%) [10], retinal detachment (3.7%) [4], only two endophthalmitis has been reported (Cohen, Faulkner-Jones) [11,12], and malignant cells seeding. There is special concern when retinoblastoma (Rb) is suspected; although there are no reports of extraocular growth of Rb, despite punctures with 25-gauge or smaller needles [13,14]. Theoretically thinner needles would carry less risk of malignant cells seeding than thicker ones. If a Rb is suspected FNAB and vitrectomy are contraindicated. Nevertheless for some authors FNAB is considered a viable diagnostic choice in selected cases of leukocoria when conventional investigative modalities are inconclusive or when the patient of suspected Rb refuses enucleation [15]. If a case of Rb is punctured and confirmed by pathology, enucleation must be performed immediately.

Histopathologic interpretation of the FNAB is crucial, surgeons should be aware that there is an increased risk of misdiagnosis because the small amount of tissue obtained, besides the technology related to sample handling. Ideally liquid-based cytology (ThinPrep® processing system for ophthalmic FNAB samples). This method is recommended because it optimizes cell yield and preservation and standardizes slide preparation for interpretation in this setting of limited material. Despite liquid-based cytology is available in Mexico, it has not been used yet in the ophthalmic pathology field. Slides processing is done manually adding conservation artifacts and causing overlapping of cells, making more complex and difficult the microscopic interpretation. Routine stains for intraocular FNAB are Papanicolaou, Diff-Quick, Hematoxylin-Eosine and Peryodic Acid Schiff. The cell block initial evaluation is under routine stains and further immunohistochemistry study.

Even with the sinuous panorama regarding intraocular FNAB in Mexico, first results are encouraging. Despite it is not innocuos FNAB in trained hands represents a useful diagnostic media. It is important to know the context that prevails, its scope and limitations in our medical environment.

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