THE ROLES OF THE ORTHOPTIST

Meticulous assessment of the anatomic and functional parameters of the eye is the key objective.

BY SILVIA TRAZZA

The orthoptist ophthalmology assistant is a health care professional who has undergone university training to specialize in the diagnosis and treatment of strabismus and visual rehabilitation of ocular motility and visual sensory disorders. The orthoptist applies instrumental ophthalmic physiologic techniques but does not operate or prescribe drug therapy. Orthoptists work from the ophthalmologist's prescription and are responsible for the organization, planning, and quality of the professional activities needed by each individual patient; the ophthalmologist writes the examination reports and performs the diagnosis and treatment of disorders of the visual system.

The role of the orthoptist varies from country to country. In many countries, including my own, the orthoptist works as a key part of the eye care team, performing vital tests that will form the basis for surgical or therapeutic decisions by the ophthalmologist. This article describes the roles of the orthoptist in the workup and follow-up care of surgical and other patients.

RECEIVING THE PATIENT

When patients come into the clinic, the orthoptist is typically the first practitioner they meet. The orthoptist strives to make patients feel at ease in reporting their visual problems and counsels them on potential surgical or therapeutic expectations after considering all of their daily activities. Information collected from patients is then relayed to the ophthalmologist.

Receiving patients is an important task for the orthoptist because, often, patients feel too intimidated to relate to the ophthalmologist and therefore do not ask questions or mention all of their personal clinical and therapeutic considerations.

CONDUCTING INVESTIGATIONS

Following a diagnostic protocol previously agreed on with the ophthalmologist, the orthoptist conducts a series of investigations to aid the ophthalmologist in making the correct diagnosis and in determining the most appropriate therapeutic or surgical strategy for a particular patient. In our clinical practice, orthoptists perform corneal wavefront topography, corneal tomography with Scheimpflug imaging, tonometry and a biomechanical corneal exam, and corneal endothelial microscopy. Other exams, such as anterior segment OCT (AS-OCT) or posterior segment OCT and ocular biometry with the IOLMaster (Carl Zeiss Meditec), are performed if required based on the patient's pathology or the ophthalmologist's request.

One aspect that is important to address before starting an exam is to determine whether the patient is a daily contact lens wearer (rigid or soft) and, if yes, for how long he or she has suspended use. This is important, especially in patients interested in refractive surgery, because contact lenses may cause corneal warpage, which induces irregular astigmatism and alters diagnostic outcomes. Corneal warpage prevents the ophthalmologist from verifying keratoconus stability or progression or accurately prescribing new ophthalmic lenses.

Sometimes a patient forgets to stop wearing contact lenses 4 to 5 days before the exam, as is requested when the appointment is scheduled. In this event, before starting the diagnostic protocol, we inform the patient that it would be

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better to repeat the eye exam after contact lens suspension; if there are logistic problems or if the patient cannot postpone the visit, we inform him or her that glasses prescription and surgical assessment could require an additional eye exam. Once this point is clarified, we begin the diagnostic exam.

PERFORMING DIAGNOSTIC TESTING

The first test we conduct is Placido-disc–based corneal topography. We perform this without excessive illumination to avoid errors of detection of the pupil center and central visual axis that could lead to altered angle kappa values. Accurate identification of angle kappa is necessary for correct centration of laser treatments. We check the patient's head position and torsional eye movements (ie, *cycloversion*). Head movements can cause variation in the astigmatic axis with respect to the optical correction incorporated in spectacles. During the topographic exam, we pay close attention to the keratoscopy image, and we evaluate the tear film quantitatively and qualitatively to assess the efficiency of the aqueous component. Placido-disc–based topography is precise, but it relies on a good quality tear film; alterations in the tear film can change the curvature on topographic images.

After acquiring the topography, we evaluate the data and inform the ophthalmologist about the following values:

- Diameter of the pupil in mesopic light conditions;
- Higher-order aberrations, which increase with an increasing pupil diameter;
- High angle kappa;
- Suspected hypercurvature and Klyce indices;
- High internal astigmatism; and
- Toric IOL axis.

This last value is compared with expected surgical axis, so that the surgeon can confirm the correction of astigmatism after implantation of a toric IOL. This measurement is often taken after pharmacologic mydriasis.

After corneal topography, we perform Scheimpflug tomography with the Pentacam (Oculus Optikgeräte). This evaluation determines the following values:

- Anterior chamber depth (noting if this value is too low to allow implantation of a phakic IOL);
- The Pentacam Nucleus Staging value, which monitors cataract progression;
- Pachymetry distribution from the center to the periphery and the thinnest corneal point;
- Suspicious values in anterior and posterior elevation maps (if we have doubts about values from topography, we check them against the Pentacam's Belin/Ambrosio Enhanced Ectasia Display and tomographic indices to detect ectasia risk); and
- Anterior and posterior corneal astigmatism values, comparing them with internal astigmatism as detected on topography.

If the patient is being seen for follow-up, we look for variations in the differential maps, especially in eyes with irregular corneal curvature or suspected keratoconus. These differential maps are important for evaluating keratoconus progression or for judging the outcome of surgical or therapeutic treatments such as CXL or refractive surgery.

Sometimes patients come to our clinic for a second-opinion consultation, and they bring their printouts from a previous exam. Especially in the presence of irregular astigmatism or suspected keratoconus, we check that the elevation maps—anterior and posterior—have the same reference best fit sphere value to allow us to assess progression of

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conditions such as keratoconus. After evaluating different tomography layouts, we select and print only the most important ones to be examined by the ophthalmologist.

The observation of corneal biomechanics during air-puff tonometry (Corvis ST; Oculus Optikgeräte) can provide important diagnostic information. We report to the ophthalmologist any alteration of instability in corneal deformation, as this may be a sign of corneal disease. In suspicious cases, especially in refractive surgery candidates, it is important to check the topographic biomechanical index value, which is the result of the integration between corneal biomechanical indices and corneal geometry indices (Belin/Ambrosio Enhanced Ectasia Display) provided by corneal tomography.

In the endothelial microscopy exam, we evaluate corneal endothelial cell morphology and density and relay our findings to the ophthalmologist. These aspects provide the surgeon with information necessary for determining the choice of phakic IOL or choosing therapeutic or pharmacologic strategies for conditions including glaucoma and corneal dystrophies. Alterations in the endothelium can also be detected on AS-OCT. Images showing endothelial detachment after deep anterior lamellar keratoplasty can help the ophthalmologist provide follow-up and choose the correct therapeutic strategy.

In a patient with a Visian ICL (STAAR Surgical) in place, we measure the distance between the posterior surface of the IOL and the anterior surface of the crystalline lens. This allows the ophthalmologist to determine whether implantation of the lens was successful.

If, during the acquisition of Scheimpflug images, we note high reflectivity or corneal alterations (eg, opacity, tissue loss), we perform AS-OCT, which can measure the thickness of opacities or hyperplasia after trauma or surgery, providing a definite advantage for the surgeon in planning a surgical procedure.

CONCLUSION

The orthoptist considers each patient individually, following a specific diagnostic protocol. He or she uses a variety of diagnostic tools, each displaying numerous screens containing different information and indices. Aiming for meticulous assessment of the anatomic and functional parameters of the eye, the orthoptist examines patients' medical records and relays the most important information to the ophthalmologist to facilitate early diagnosis of corneal disease and informed therapeutic and/or surgical decision-making. In this way, the orthoptist works alongside the ophthalmologist as a valuable member of the eye care team. ■

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