


Chapter 14

Fundus Examination in Pediatric Patients Using Indirect Ophthalmoscopy: Binocular Indirect Ophthalmoscopy (BIO), BIO With Scleral Indentation, BIO in Premature Infants

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ABSTRACT

The goal of this chapter is to provide the clinician with an understanding of binocular indirect ophthalmoscopy (BIO) and helpful clinical techniques for success in examining the fundus of the pediatric patient, including scleral depression. The challenging technique to examine the premature infant at risk for retinopathy of prematurity will be explained in detail, including the standard classification of the disease with photos depicting the different location and stages of disease. BIO with the addition of scleral indentation helps the clinician diagnose and locate lesions that may otherwise go undetected, such as retinal holes, tears, or vitreoretinal adhesions. Complete examination of the fundus of a child is no less important than of any other patient who seeks eye care but often requires efficiency and precision (as well as many human arms). Time is a rate limiting aspect when examining children so preparation and experience will lead to success.

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INTRODUCTION

The goal of this chapter is to provide the clinician with an understanding of binocular indirect ophthalmoscopy (BIO) and helpful clinical techniques for success in examining the fundus of the pediatric patient. The challenging technique to examine the premature infant at risk for retinopathy of prematurity will be explained in detail, including the standard classification of the disease with photos depicting the different location and stages of disease. BIO with the addition of sclera indentation, which allows for greater ease in viewing tissue layer separation and surface irregularities, will be covered as well. This helps the clinician diagnose and locate lesions that may otherwise go undetected, such as retinal holes, tears or vitreoretinal adhesions.

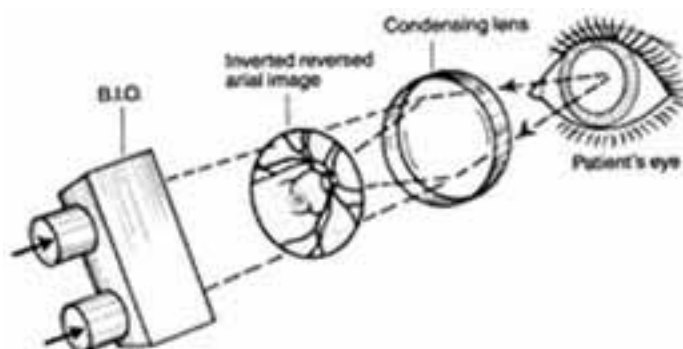
BIO in children is significantly more challenging as they often must be cajoled into allowing the exam or restrained for adequate examination. Use of parents to hold children during the exam and use of toys to get the attention of the child during the exam are often needed to successfully perform the fundus exam. Complete examination of the fundus of a child is no less important than of any other patient who seeks eye care but often requires efficiency and precision (as well as many human arms). Since time is a rate limiting aspect when examining children, preparation and experience will lead to success. Scleral depression is a necessary element in the examination of the premature infant for retinopathy of prematurity and the critical elements of this disease and the examination to diagnose this disease is discussed at length in this chapter.

BINOCULAR INDIRECT OPHTHALMOSCOPY (BIO)

Background

Binocular indirect ophthalmoscopy (BIO) consists of a headband apparatus, optical viewing system, and rheostatically controlled illumination source (Figure 1). The light beam from the BIO is directed into the child's eye which produces reflected observation beams from the retina. With a high plus powered condensing lens, these beams create an aerial image at its focal distance in front of the patient's eye (Figure 2). The resultant image is real, magnified 1.5x to 3.5x, reversed left to right, inverted top to bottom, and located between the examiner and the condensing lens (Figure 3).

*Figure 1. Binocular indirect ophthalmoscopy (BIO) components: headband, optical viewing system and illumination source
(Courtesy of Welch Allyn)*



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