

Journal of Diagnostic Medical Sonography

<http://jdm.sagepub.com/>

A Prenatal Diagnosis of Dacryocystocele

Audrey Mendenhall

Journal of Diagnostic Medical Sonography 2003 19: 36

DOI: 10.1177/8756479302239549

The online version of this article can be found at:

<http://jdm.sagepub.com/content/19/1/36>

Published by:



<http://www.sagepublications.com>

On behalf of:



**Society of Diagnostic
Medical Sonography**

[Society of Diagnostic Medical Sonography](http://www.sdmsonography.org)

Additional services and information for *Journal of Diagnostic Medical Sonography* can be found at:

Email Alerts: <http://jdm.sagepub.com/cgi/alerts>

Subscriptions: <http://jdm.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

Citations: <http://jdm.sagepub.com/content/19/1/36.refs.html>

>> [Version of Record](#) - Jan 1, 2003

[What is This?](#)

A Prenatal Diagnosis of Dacryocystocele

AUDREY MENDENHALL, RDMS, RDCS, RVT

Dacryocystocele or lacrimal duct cyst is a benign mass resulting from a congenital obstruction of the lacrimal system. These cystic masses can be detected sonographically after 30 weeks menstrual age. This case study presents ultrasound diagnosis of the dacryocystocele at 33.5 weeks menstrual age after multiple previous sonograms, demonstrating normal fetal facial anatomy.

Key words: dacryocystocele, lacrimal duct cyst, periorbital dermoid, periorbital hemangioma, encephalocele

Case Presentation

A primigravida exposed to fifth disease at 6 weeks menstrual age with positive parvo titers (PB19) was referred for a 19-week obstetrical sonogram. The fetus measured consistent with 18.9 weeks of gestation, and normal fetal anatomy was observed. All examinations were performed using the Acuson 128XP10 (Mountain View, CA) with a 4 MHz vector array transducer. Due to the patient's positive titers, subsequent serial sonograms were performed. A sonogram at 25 weeks menstrual age again demonstrated normal fetal growth and anatomy. A third sonogram conducted at 28.5 weeks menstrual age revealed normal fetal anatomy, but the fetal head measurements were slightly larger than expected (31.7 weeks) when compared to the fetal abdomen (27.9 weeks) and femur length (28.8 weeks) and prior sonograms (28.5 weeks). A fourth and final sonographic examination was performed at 33.5 weeks menstrual age. The purpose of this examination was to evaluate fetal head growth and to detect potential fetal hydrops caused by parvovirus exposure. Again, the fetal head measurements were larger than expected (36 weeks). Normal intracranial anatomy and no evidence of fetal hydrops was seen. However, an 11.0 × 11.0 × 9.6 mm hypoechoic mass was visualized inferomedially to the right eye (see Fig. 1). It appeared to

From Sound Health Imaging, Butte, Montana.

Correspondence: Audrey Mendenhall, PO Box 4168, Butte, MT 59702. E-mail: amendenhall@ineva.com.

The author would like to acknowledge the assistance of Mr. Wayne Persutte, University of Colorado Health Sciences Center, for his guidance and support.

DOI: 10.1177/8756479302239549



FIG. 1. Sonogram demonstrating right and left fetal orbits with dacryocystocele located medial to right fetal orbit.



FIG. 2. Sagittal imaging plane through right fetal orbit demonstrating the dacryocystocele inferior to orbit.

be fluid filled and could be seen displacing the skin anteriorly (see Fig. 2). Doppler evaluation of the mass revealed no vascularity. These findings were consistent with a diagnosis of fetal dacryocystocele. The patient was admitted at 39 weeks for an elective cesarean section. A 3068-g female infant was delivered without complications. On examination, the newborn had a blue-gray swelling below the canthus of the right eye (see Fig. 3). The diagnosis of the dacryocystocele was confirmed.



FIG. 3. Dacryocystocele seen as a subtle bluish-gray swelling medial to the right eye in newborn infant. (Written parental permission for full-face image obtained.)

The mass spontaneously resolved within 5 days of birth.

Discussion

To understand the etiology of the dacryocystocele, one must understand the normal development of the lacrimal duct. At 32 days gestation, the maxillary and frontonasal prominences appear. As these processes enlarge, a groove forms between them. At 42 days gestation, the lacrimal drainage system begins its formation in this groove. A solid rod of epithelial cells lies between the future medial canthus of the eye and the nasal cavity. Initially, the uppermost rod of epithelial cells bifurcate and form the superior and inferior canaliculi. The canaliculi form the tract from the superior and inferior puncta (tear ducts) to the lacrimal sac. Canalization of the canaliculi and puncta is usually complete at the time the eyelids separate at approximately 7 months gestation. Approximately 90% of the time, the superior and inferior

canalculi come together to form a common canaliculus that then enters the lacrimal sac. There is redundant endothelial tissue within the lacrimal sac that creates the valve of Rosenmuller. The valve of Rosenmuller prevents reflux of the tears into the canaliculi from the lacrimal sac. The lacrimal sac opens into the nasolacrimal ducts, which terminate in the nasal cavity. A double layer of epithelium lines the nasolacrimal duct similar to that of the lacrimal sac. Again, redundancy in the folds of epithelium creates the valve of Hasner located at the most distal portion of the duct.¹ During early development, the lacrimal system begins to form at about 6 weeks of pregnancy. Canalization of the nasolacrimal duct system begins at about 12 weeks of pregnancy with development of the proximal duct and continuing caudally toward the nasal cavity. By 8 months gestation, the lacrimal duct becomes patent² and fluid can drain from the eye into the nasal cavity. However, the distal end of the system may remain imperforate distal duct membrane (Hasner's valve) inferiorly, and Rosenmuller's valve superiorly prevents reflux from the lacrimal sac creating the dacryocystocele.³ Most dacryocystoceles resolve spontaneously, either in utero or shortly after birth.² Postnatal probing to canalize the lacrimal pathway may be performed if spontaneous resolution does not occur.⁴

Prenatal differentiation of periorbital masses can be difficult. The differential diagnosis of these masses may include encephalocele, periorbital dermoid, periorbital hemangioma, and dacryocystocele.³⁻⁶ These abnormalities have significantly different diagnostic implications and prognosis. The anterior midline is a common site for an encephalocele. The anterior encephalocele presents with a bony defect, displaces the globe of the eye downward and outward, and is often associated with hydrocephaly.³ A periorbital dermoid tends to be located in the superior lateral aspect of the orbit and has a complex sonographic appearance.³ Periorbital hemangioma may occur in the inferiormedial aspect of the orbit and may have marked vascularity evident on Doppler evaluation. Facial hemangioma also has solid or complex signature sonographically.³ The dacryocystocele presents sonographically as a hypoechoic mass located

inferiormedial to the orbit, and it does not displace the globe. Dacryocystoceles are fluid filled without vascularity demonstrated on Doppler evaluation.³ In the present case, the following features were consistent with fetal dacryocystocele: the location of the mass, the lack of vascularity, the anechoic appearance, and time of presentation.

The discovery of a periorbital mass at the time of the patient's fourth sonogram for fetal surveillance was disconcerting. Initially, there was concern that the mass had been missed on previous sonograms. However, the dacryocystocele is typically not identifiable until after 30 weeks gestation.^{3,5}

While dacryocystoceles are benign in nature, they may be a part of various syndromes, and their identification prompts the investigator to carefully examine the fetus for other associated anomalies.⁷ Dacryocystoceles are clinically insignificant and must therefore be differentiated from other potentially problematic pathologies. Differentiation is made possible by mass location in the region of the lacrimal duct, time of presentation after 30 weeks gestation, hypoechoic appearance, lack of vascularity demonstrated on Doppler evaluation, absence of calvarial defects, and absence of displacement of the globe of the eye.

References

1. McCord C: The lacrimal drainage system, in Duane T (ed): *Clinical Ophthalmology*. Vol 4, Chap. 13. Philadelphia, Harper and Row, 1984.
2. Kivikoski A, Amin N, Cornell C: Antenatal sonographic diagnosis of dacryocystocele. *J Matern-Fetal Med* 1997; 6:273-275.
3. Sherer D, Eisenberg C, Hammerman R, Katz N: Prenatal sonographic diagnosis of dacryocystocele: a case and review of the literature. *Amer J Perinatol* 1997;14(8):479-481.
4. Goldberg H, Sebire NJ, Holwell D, Hill S: Picture of the month: prenatal diagnosis of bilateral dacryocystocele. *Ultrasound Obstet Gynecol* 2000;87:448-449.
5. Callen P: *Ultrasonography in Obstetrics and Gynecology*. Philadelphia, W. B. Saunders, 2000.
6. Suma V, Marini A, Bellitti F, Buccini N, Dorov D: Letter to the editor: prenatal sonographic diagnosis of dacryocystocele. *Ultrasound Obstet Gynecol* 1999; 14:74.
7. Sharon R, Raz J, Aviram R, Cohen I, Beyth Y, Tepper R: Prenatal diagnosis of dacryocystocele: a possible marker for syndromes. *Ultrasound Obstet Gynecol* 1999;14(1): 71-73.