In contrast, direct paraffin embedding of vitrectomized specimens requires a large number of cells, as in cases of vitreous hemorrhage, endophthalmitis, or diabetic retinopathy. In these instances, a considerable amount of cells will be lost.3,4

Paraffin embedding of vitrectomized intraocular fluids using the fibrin and paraffin method has the following important advantages. Specimens with small numbers of cells from patients with macular pucker or retinal detachment without hemorrhage can be analyzed using all histologic techniques, including immunohistochemical analysis, which is not possible with cytologic preparation techniques. The second major advantage is the possibility of archiving specimens for future studies.

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Pleomorphic Adenoma of the Lacrimal Gland in a Child After Treatment of Acute Lymphoblastic Leukemia

Among all orbital masses in children, tumors and related lesions of the lacrimal gland are very uncommon (1.8%-2.4%). Most of these prove to be nongranulomatous or granulomatous chronic dacryoadenitis, with only a few being neoplasms.1

Pleomorphic adenoma (benign mixed tumor) of the lacrimal gland (PALG) is a benign tumor that

Figure 2. Vitrectomy specimen from a patient with chorioretinitis showing few lymphocytes and neutrophils (hematoxylin-eosin, original magnification ×250).

Figure 3. Vitrectomy material from the same patient in Figure 2 showing cells of the nuclear layer of the retina (hematoxylin-eosin, original magnification ×250).

Figure 4. Positive staining of melanoma cells for HMB45 from a patient with uveal melanoma (streptavidin-biotin, original magnification ×250).

Figure 5. Vitrectomy specimen from a patient with diabetic retinopathy showing erythrocytes and fibrotic tissue (Masson trichrome, original magnification ×100).
mostly arises in the orbital lobe. It is quite common in adults but very rare in children. In published series of orbital masses in children by Shields et al and Kdzi et al, and 250 masses, respectively, included no case of PALG. We are aware of only 4 cases reported in children aged 14 years or younger and another 3 cases reported in adolescents, with the first being reported in 1938 by Sanders and with a 6-year-old boy as the youngest patient at the time of diagnosis. Mercado et al reported the case of a PALG in a 15-year-old girl. None of these cases had any history of chemotherapy or radiotherapy for leukemia or any deficiency of the immune system.

Report of a Case. We herein describe a 14-year-old white girl who was initially examined at our clinic because of a swelling of the upper lid that increased for 3 years. The medical history disclosed that the girl was in first remission after therapy for acute lymphoblastic leukemia (ALL) following a Berlin-Frankfurt-Münster regimen that included daunorubicin hydrochloride, doxorubicin hydrochloride, cyclophosphamide, and methotrexate disodium. Cranial irradiation (1200 rad) was given for prophylaxis of the central nervous system.

Ophthalmological examination showed a palpable nodular mass under the temporal half of the superior orbital rim with mild ptosis of the right eye (Figure 1A). The globe was displaced downward with a restriction of elevation. The patient experienced no pain. Visual acuity, intraocular pressure, and results of ophthalmoscopic assessment were normal.

Magnetic resonance imaging showed a multicystic contrast-positive enlargement of tissue in the lacrimal fossa. There were no signs of osseal destruction (Figure 1B).

We decided to perform surgical excision of the orbital mass. After a superior orbitotomy, we found an encapsulated solid nodule in the lacrimal fossa closely associated with the lacrimal gland. The noninvasive tumor was excised completely within its intact capsule. The specimen measured $3.4 \times 2.2 \times 1.6$ cm (Figure 2A).

During a 2-year follow-up, the patient showed no signs of recurrence.

Histopathologic Findings. Histologically the capsulated tumor consisted of epithelial and mesenchymal-like tissues (Figure 2B). The epithelial component consisted of nests and cords of monomorphic cells, some of which were arranged in tubules containing protein that was positive for periodic acid–Schiff stain. Myoepithelial cells within the epithelial cords could not be detected immunohistochemically by antibodies against smooth-muscle actin. We found no nuclear irregularity or mitosis. The second component of the tumor consisted of a myxoid and chondroid matrix containing mesenchymal cells that resembled chondrocytes and were positive for alcian blue stain (Figure 2C). There were no signs of a relapsed ALL.

The histopathologic diagnosis was of a myxochondromatous variation of a PALG.

Comment. The appropriate therapy for PALG is surgical excision. If such tumors are excised completely within their capsules, the 5-year recurrence rate is 3%, com-

Figure 1. A, Frontal view of our patient showing swelling of the right upper lid. B, Magnetic resonance image shows a multicystic contrast-positive tissue enlargement in the lacrimal fossa.

Figure 2. A, Excised mass with intact capsule. B, The lacrimal pleomorphic adenoma has a thin fibrous and inflamed capsule separating the tumor from the gland. The anastomosing trabeculae of cordlike epithelial cells show sparse well-formed ductal or tubular structures that are closely associated with an interposed stromal component. This mesenchymal component of the pleomorphic adenoma contains some stellate mesenchymal cells. Bleeding and necroses are not evident (hematoxylin-eosin, original magnification ×100). C, Area of the chondroid matrix containing groups of balloon cells similar to chondrocytes. A well-defined border delimits this area. The cell-rich epithelial component consists of monomorphic cells with a complete absence of stroma. Nuclear irregularities were absent (alcian blue, original magnification ×400).
pared with 32% if the tumors undergo biopsy before removal. Rupture of the capsule of a PALG affects the prognosis adversely because of seeding of tumor cells into the surrounding tissues and malignant transformation.7

The etiology of PALG is unknown.

Our patient was initially seen in a condition of first remission 10 years after B-cell–type ALL. At 4 years of age, she received chemotherapy that included daunorubicin, doxorubicin, cyclophosphamide, and methotrexate. Cranial irradiation (1200 rad) was given for prophylaxis of the central nervous system. The treatment of children with ALL is increasingly successful, with a current overall survival rate of almost 80%. However, the immunosuppressive and cytotoxic therapy necessary to achieve this improvement increases the risk of subsequent complications. There is a 14-fold increase in the incidence of secondary neoplasms after therapy for ALL. The cumulative risk of secondary neoplasms in first complete remission ranges from 1.9% to 2.9% by 15 to 20 years.8,9

The literature contains no report of an association between chemotherapy or irradiation and the incidence of PALG. However, there is evidence that salivary gland tumors can be caused by therapeutic irradiation of the head in childhood, with a long latency and in a dose-response manner.10,11 A 2.6-fold incidence of benign mixed tumors (pleomorphic adenomas) or a 4.5-fold incidence of malignant neoplasia of the salivary gland was noted in a cohort of patients who received 350-rad irradiation of the head for tinea capitis in childhood.12

It is therefore possible that the development of PALG, which shows clinical and histological similarity to the salivary gland tumors mentioned in the preceding paragraph, was influenced by irradiation and chemotherapy for ALL in our case.

The increasing number of children surviving ALL indicates a need for awareness of such neoplasms (which were previously considered to be very rare), comprehensive examination, and long-term follow-up.

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Reversible Changes in Frequency-Doubling Perimetry With Transiently Elevated Intraocular Pressure

Frequency-doubling technology (FDT) has been useful in screening patients for glaucoma. One report shows that 1 drop of unoprostone could induce improvement with FDT by lowering intraocular pressure and increasing ocular blood flow.2 We examined 1 patient with secondary glaucoma and transient rise of high intraocular pressure with FDT and with a Humphrey field analyzer (HFA) (Carl Zeiss Meditec, Inc, Dublin, Calif) for 1 year to study the effect of intraocular pressure on visual field results.

Report of a Case. A 33-year-old woman had had attacks of high intraocular pressure with slight inflammation several times in both eyes. Her visual acuity was 20/16.7 OU. Fluorescein angiography showed no abnormal findings. With maximally tolerated therapy, intraocular pressure remained higher than 40 mm Hg OS, and the patient underwent trabeculectomy in that eye. Her left intraocular pressure stayed in the 20s after surgery. Her right intraocular pressure transiently rose to higher than 40 mm Hg with maximally tolerated therapy. The high pressure decreased to normal levels within 1 month. The patient had large disc cupping in the right eye; a 0.472 cup-disc ratio was determined using a retina tomograph (Heidelberg Engineering, Heidelberg, Germany). The HFA visual fields were always normal independent of intraocular pressure for 1 year (Figure 1) (Table). The FDT, however, showed abnormal areas only twice during the same period, with high intraocular pressure (> 40 mm Hg) (Figure 2). On the same day in February 2002, when intraocular pressure was 45 mm Hg, the FDT showed abnormal findings while the HFA appeared normal. During the final attack, 1% apraclonidine reduced intraocular pressure transiently and improved the FDT mean deviation slightly in 1 hour (Figure 2). The FDT mean deviation correlated well with changes in the intraocular pressure, but not necessarily with the FDT pattern standard deviation (Table). No inflammatory cells were seen in the anterior chamber of the right eye and no corneal edema was observed during the attacks.