Ocular findings in linear sebaceous naevus syndrome

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SUMMARY The case of a 5-month-old black female child with a linear sebaceous naevus syndrome and multiple congenital anomalies is presented. Ocular malformations consisted of colobomatous changes of the lid and retina, dermoid of the conjunctiva, chorioretinal changes, and peripapillary atrophy of the optic nerve. Systemic findings included midline cleft of the secondary palate with involvement by the naevus, bilateral hearing loss, asymmetrical skull bones, ventricular septal defect, epidermal inclusion cyst, and developmental delay without seizures.

Jadassohn in 1895 was the first to employ the term organoid naevus as a distinct entity from pigmented naevi. In 1932 Robinson surveyed the literature and introduced the term 'naevus sebaceous of Jadassohn'. Feuerstien and Mims defined a new neurocutaneous syndrome in 1962 consisting of the triad of linear sebaceous naevus, convulsions, and mental retardation. Neurocutaneous syndromes include congenital lesions of the skin and of the central nervous system and often involve ocular and visceral malformations. Tuberous sclerosis, neurofibromatosis, Sturge-Weber disease, and von Hippel-Lindau disease all fall under the domain of neurocutaneous syndromes which are all ectodermal dysplasias.

More recent cases expanded the scope of symptoms encountered in the new neurocutaneous syndrome. Marden and Venter presented a case study showing that mesodermal malformations could be involved in the new neurocutaneous syndrome. Anomalies in their patient included severe failure to thrive, hydrocephalus, colobomas of the irides and choroid, lipodermoids, slanting of the auricle, multiple naevi, coarctation of the aorta, skull deformities, and the triad of linear sebaceous naevus, mental retardation, and seizures. Moynahan and Wolff further expanded the possible symptoms associated with the linear sebaceous naevus. They described a patient who had a linear sebaceous naevus, generalised EEG irregularities, skull asymmetry, conjunctival lipodermoids, and cortical atrophy of the right hemisphere as indicated by transillumination over the right frontal region of the skull.

The following case provides an interesting constellation of findings and helps to illustrate both common features and variations encountered in the linear sebaceous naevus syndrome.

Case report

A 5½-month-old female child was referred because of failure to thrive and multiple congenital anomalies. She weighed 7 pounds 12 ounces (3515 g) at birth after a normal spontaneous vaginal delivery without complications.

Immediately on examination a midline, vertical, hyperpigmented, papular lesion extending from the anterior fontanelle to the upper lip was noted. Similar lesions were present over the cheeks, left ear, chest, left arm, and neck extending down the back (Fig. 1). Irregular areas of hyperpigmentation were noted on the lower limbs. The patient was also noted to have a midline palatal cleft of the secondary palate, and a soft tissue mass encroaching on the temporal limbus in the left eye. There was no family history of any neurological or dermatological disease.

PHYSICAL EXAMINATION

On admission the child was a cachectic, weak infant. Anthropomorphic measurements were: head circumference 39.5 cm (<5% percentile), length 55 cm (<5% percentile), and weight 3.72 kg (<5% percentile). There was slight asymmetry of the skull on the right side. On auscultation of the chest a regular rate and rhythm with a II/VI systolic ejection murmur heard best at the left lower sternal border was noted. A 2 x 2 cm midline mass was located 1 cm below the umbilicus. Neurological examination

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Fig. 1 Hyperpigmented skin lesion present on face and lower jaw of 5½-month-old female child.

revealed decreased tone throughout, without focal neurological findings.

OCULAR EXAMINATION
Visual acuity appeared to be normal in both eyes, though the child showed a preference for the right eye. The pupils were equal, round, and reactive to light. The extraocular movements were within normal limits in both eyes. External examination revealed a circumferential yellow, lipoid-like subconjunctival deposit encroaching on the temporal limbus of the left eye. In addition a coloboma of the right upper lid was evident (Fig. 2). Funduscopic examination of the left eye showed a choroidal and disc coloboma with chorioretinal changes. Examination of the right fundus revealed peripapillary atrophy of the disc also with chorioretinal changes.

LABORATORY DATA
The haemoglobin was 12.1 g/dl and the packed cell volume was 36.9%, with a white blood cell count of 11.7 x 10^9/l. A random blood glucose test gave 65 g/dl (3.6 mmol/l); the blood urea nitrogen value was 9 g/dl (1.5 mmol/l). It was also determined that the patient had a normal female karyotype.

Skull x-ray showed minimal asymmetry of the skull on the right side, with a suggestion of some asymmetry of the sphenoid bone on the left side. A bone scan of the skull was performed to help rule out craniosynostosis. It proved negative. An electroencephalogram showed evidence of voltage asymmetry, with the presence of suspicious slowing over the left hemisphere that was non-specific in nature.

A chest x-ray showed a slight boot shaped heart with an uptilted apex suggestive of right ventricular hypertrophy. The electrocardiogram showed some right ventricular hypertrophy. M-mode and TT echocardiograms revealed a small ventricular septal defect with slight poststenotic aortic dilatation. A filling defect in the pharynx, which was later found to be a redundant uvula, a partial malrotation of the jejunum, and a small sliding oesophageal hernia were visualised during a gastrointestinal x-ray examination.

Tymanometry was performed and showed type B changes bilaterally. A brain stem evoked response showed conductive hearing loss bilaterally with possible mixed changes, particularly on the right side.

SURGICAL PROCEDURES
The patient underwent conjunctival biopsy, biopsy of the abdominal lesion near the umbilicus, placement
of pressure equalising tubes, and intervelar veloplasty with palatoplasty utilising redundant uvula. At the time of surgery it was noted that the naevus appeared to involve the upper lip, the entire soft palate, and the right buccal mucosa. The bifid uvula was thickened and enlarged as well as elongated. Histological examination of the conjunctival biopsy revealed a dermoid. The biopsy of the uvula proved to be a squamous papilloma, and examination of the abdominal biopsy showed an epidermal cyst. During this same admission to hospital a histopathological analysis was also made of the skin lesion, which showed sebaceous gland hyperplasia consistent with a sebaceous naevus (Fig. 3).

One and one-half years after discharge from hospital the child has not had a seizure, but she still appears to be developmentally delayed according to the primary care physician.

Discussion

Mehregan and Pinkus' reviewed 150 cases of organoid naevus which consisted mostly of the type designated naevus sebaceus of Jadassohn. Their analysis provides a description of the life history and a discussion of the malignant quality of the lesion. The first phase of the life history involves under-

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Table 1  Associated findings in linear sebaceous naevus syndrome

<table>
<thead>
<tr>
<th>External disease</th>
<th>Lipodermoid of upper lid*</th>
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<tr>
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<td>Unilateral ptosis*</td>
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<td></td>
<td>Coloboma of upper lid*</td>
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<tr>
<td>Anterior segment disease</td>
<td>Lipodermoids (unilateral and bilateral) of conjunctiva*</td>
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<td>Vascularisation of cornea*</td>
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<td>Coloboma of iris*</td>
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<td>Corneoscleral mass (lacrimal and cartilage choristoma)*</td>
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<td>Intrascleral cartilage and bone*</td>
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<td>Cataract*</td>
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<td>Posterior segment disease</td>
<td>Retinal degeneration with chorioretinal coloboma*</td>
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<td>Retinal detachment with rosette formation*</td>
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<td></td>
<td>Peripapillary atrophy*</td>
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<td></td>
<td>Coloboma of optic disc</td>
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<tr>
<td>Others</td>
<td>Nystagmus*</td>
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<td></td>
<td>External oculomotor nerve palsy with pupillary 'sparing'*</td>
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<td></td>
<td>Cortical blindness*</td>
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<td>Esotropia*</td>
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*Our case.

Fig. 3  Naevus sebaceus of Jadassohn showing hyperkeratosis, acanthosis, and hypertrophied sebaceous gland in the superficial corium. H and E.

The second phase, occurring at the time of puberty, is characterised by massive development of sebaceous glands, papillomatous epidermal hyperplasia, and maturation of apocrine glands. The final stage is heralded by the development of benign and malignant naevoid tumours. Fifty-two tumours developed within the organoid naevi in 33 patients. The distribution was as follows: basal-cell epithelioma (21), syringadenoma papilliferum (8), solid hidradenoma (6), infundibuloma (5), sebaceous epithelioma (4), apocrine cystadenoma (4), and keratoacanthoma (4).

Solomon* appears to have coined the name 'epidermal naevus syndrome' in reporting 44 patients, many with the findings of naevus sebaceus of Jadassohn: 71% of his patients had skeletal anomalies, 46% had central nervous system (CNS) abnormalities, and 38% had both.

Many ocular findings have been described in association with linear sebaceous naevus syndrome (Table 1). They include colobomas of the lid, epibulbar lipodermoids, bulbar dermoids with pannus formation, iris and chorioretinal colobomas, generalised retinal degeneration, antimongoloid lid fissures, asymmetry of orbital bones, peripapillary ectasia of the sclera, and esotropia. In 1972, Haslam and associates* presented a case of unilateral external oculomotor nerve palsy with pupillary sparing. Lansky et al.* in that same year published a case of linear sebaceous naevus syndrome in association with cortical blindness. Bilateral Coats' disease was identified in a 4-year-old girl with ichthyosis hystrich,
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a variant of the epidermal naevus syndrome. Burch et al.\textsuperscript{11} suggested a possible relation between this finding and other vascular abnormalities and malfunctions seen in this syndrome. In 1981 Wilkes et al.\textsuperscript{12} reported a case of a 13-year-old boy who had an ipsilateral facial sebaceous naevus in association with a left corneoscleral limbal mass composed of lacrimal tissue and cartilage, together with intratarsal cartilage and bone. Retinal detachment and rosette formation were present on the left, while the findings in the right eye were a myopic crescent, peri papillary atrophy, and a colobomatous defect of the optic disc.

Our patient appeared to have normal visual acuity with a left temporal conjunctival dermoid, coloboma of the retina and disc, and chorioretinal changes. The right eye had a coloboma of the upper lid, peripapillary atrophy of the disc, and chorioretinal changes.

No race, sex, ethnic, familial, or predisposing factors are known to be associated with the syndrome.\textsuperscript{10} As in this case the appearance of the syndrome is a sporadic event with no clear inheritance pattern. An exception is a case reported by Bianchine\textsuperscript{13} of a patient with the new neurocutaneous syndrome who had a familial history of convulsions and mental deficiency.

Patients often have asymmetry of the sphenoid bones.\textsuperscript{8} Additional cranial anomalies include widening of the sella, hydrocephalus, hemimacrocephaly, and unilateral ventricular widening.\textsuperscript{14} Lansky and co-workers\textsuperscript{15} discussed the association of cutaneous manifestations ipsilateral to the abnormal encephalographic focus. This patient’s electroencephalogram revealed voltage asymmetry with diffuse slowing over the left hemisphere of a suspicious nature. The most common EEG finding involves focal and multifocal spiking, with other EEG tracings described.\textsuperscript{16} Herbst and Cohen\textsuperscript{17} first reported an association of a typical hypsarhythm pattern with the linear sebaceous naevus. This type of pattern generally indicates a diffuse brain lesion according to the authors.

The new neurocutaneous syndrome involves the triad of linear sebaceous naevus, mental retardation, and seizures. The typical cutaneous lesions (circumscribed, firm, flat, yellow plaques with smooth, furrowed surfaces) and mental retardation (developmental delay), but not seizure activity, characterised our patient. This case represents a forme fruste of the syndrome. Other variants of the new neurocutaneous syndrome have been described. Lantis and associates\textsuperscript{17} discussed two cases of linear sebaceous naevus which did not have the triad. Their patients had ocular dermoids, linear sebaceous naevus, coloboma of the eyelid, and abnormal skull x-rays; however, neither patient was mentally retarded or had experienced seizure activity.

The clinical outcome in linear sebaceous naevus syndrome is usually not fulminant. However, Mollica et al.\textsuperscript{18} presented a case of a newborn baby with neurological symptoms and extensive malformations, including angiomas of the scalp, lipodermodermis of the conjunctiva, adenoma of the liver, horseshoe kidney, patent ductus arteriosus, and diffuse epidermal naevus. The baby died 36 hours post partum. At necropsy a large leptomeningeal haemangioma was found in the middle fossa, with associated intraventricular and ependymal haemorrhage. The authors suggested that the neurological symptoms of the linear sebaceous naevus syndrome may be the result of hamartomatous lesions of the CNS.

Armed with the knowledge of the life history and the associated anomalies the physician is better equipped to diagnose and treat the linear sebaceous naevus syndrome. Our case demonstrated several characteristic features and the newly recognised association of a midline cleft of the secondary palate with extensive naevus involvement of the buccal mucosa and a bifid uvula.

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