Multicentric Infantile Myofibromatosis
-A Case Report-

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We present a case of multicentric infantile myofibromatosis in a 3-month-old male infant who had multiple papular lesions on his extremities and trunk and a slowly growing and bulging mass on his left occipital area since birth. His general physical condition was good and psychomotor development was normal. The diagnosis was established by histopathological and immunohistochemical studies along with clinical manifestations and imaging findings. The patient underwent left occipital craniectomy and the defect was repaired with bone cement. He had been doing well with spontaneous regression of one of the skin lesions on his face 6 months after the operation. (Dermatol Sinica 24: 47-51, 2006)

Key words: Infantile Myofibromatosis, Craniectomy

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INTRODUCTION

Infantile myofibromatosis (IM) is a rare mesenchymal disorder presenting as single or multiple nodules affecting deep dermis, subcutis, soft tissue or internal organ. Although considered as a rare entity, IM is the most common fibrous tumor of infancy. The clinical appearance is non-specific and could lead to misdiagnosis. There is a wide spectrum of differential diagnosis and the prognosis is variable. A search for the extent of involvement is important for prognostic and therapeutic purposes and genetic counseling of the family members is indicated. An infant born with multicentric infantile myofibromatosis is documented and the literature was reviewed with emphasis on prognostic factors and management.

CASE REPORT

A 3-month-old male infant presented with multiple asymptomatic erythematous firm papules on his lower extremities and trunk (Fig. 1) and a slowly growing and bulging firm mass measuring 3×3 cm on his left occipital area since birth (Fig. 2). There was neither bleeding nor ulceration. No urticarial reaction could be elicited on rubbing the lesions. Physical examination was unremarkable. The lesions did not increase in number after birth. He was a term baby after an uneventful pregnancy and with a good general physical condition and age-appropriate psychomotor development. There was no family history of similar lesion. Laboratory examinations including peripheral blood count, renal and liver function tests, electrolytes, calcium and phosphorus were all within normal range.

Chest radiographs showed multiple osteolytic lesions in the ribs and metaphysis of long bones of upper and lower extremities. A cranial ultrasound examination with color Doppler of the occipital area showed a subcutaneous echolucent cyst measuring 22×13 mm. No blood flow was seen. Abdominal sonographs revealed no lesion in the internal organs except two well-defined central hypoechoic masses on the abdominal and chest walls. Brain magnetic resonance imaging, with and without contrast media, demonstrated a nodular mass measuring 20×15×15 mm in left skull bone and a subcutaneous cystic lesion measuring 22×17×8 mm on left adjacent occipital scalp. A skin biopsy of a lesion on his left leg showed a dermal biphasic tumor composed of bundles of smooth muscle-like spindle cells surrounded by cellular areas of small cells with round to oval nuclei (Fig. 3a, 3b). The myofibroblastic phenotype was confirmed by the presence of smooth muscle actin and calponin immunoreactivity. Desmin and S-100 protein were negative (Fig. 4). The labora-

Fig. 1
One erythematous and scaling firm papule on patient's left thigh.

Fig. 2
One slowly growing and bulging firm mass measuring 3×3 cm on his left occipital area.
tory studies support the diagnosis of infantile myofibromatosis.

He was then referred to pediatric neurosurgery for evaluation and treatment. The skull tumor was excised. They were subcutaneous, invading the skull bone, with attachment to the dura mater. The skull defect was repaired with bone cement. Histologically, the tumor showed nodular and bundles of smooth muscle-like spindle cells with focal hyaline sclerosis. Neither mitosis nor cellular pleomorphism was seen.

He was quite well after operation and had been doing well without evidence of recurrence. Spontaneous regression of one of the skin lesions on his face was noted 6 months after the operation.

**DISCUSSION**

Infantile myofibromatosis is a rare mesenchymal disorder of infancy and early childhood. It was first described by Stout in 1954 as "congenital generalized fibromatosis". The term "infantile myofibromatosis" was first coined by Chung and Enzinger in 1981 based on the histological and ultrastructural resemblance of tumor cell to myofibroblasts and the frequent occurrence in both newborns and infants. Wiswell et al. subclassified the condition into solitary and multiple lesions with further subdivision into the presence or absence of visceral involvement. It typically presents as a solitary or multiple lesions involving skin, soft tissues, bone and viscera. The disease is usually found in the first decade of life with 88% of cases detected before the age of 2 years and 60% at or shortly after birth. And the condition is approximately twice as common in males as in females. In cases without visceral involvement, the prognosis is excellent with expected spontaneous regression of nodules in 1 to 2 years. However, visceral lesions are associated with significant morbidity and mortality generally within the first few months of life. The solitary form is more common, affecting about 80% of all cases and occurring predominately in males.
Over 50% of patients with solitary lesions have lesions present at birth or soon after.1,4 and 90% appear prior to age 2 years. In one series, approximately 50% appeared on the head and neck, 25% on the trunk and 25% on the limbs.5 Solitary lesions appear in the dermis and subcutis more frequent than in the muscle and bone and only rarely in the viscera.6 In the multicentric form, lesions appear more frequently at birth and in female. Over 90% with multiple lesions present at birth or soon after.2 Visceral involvement has been detected in 25-35% of multicentric cases and most visceral lesions are present at birth.6 Lesions have been found in nearly all kinds of tissue, including the bone, lip, oral cavity, central nervous system, lungs, myocardium, liver and biliary tree.7 Bony lesions affect the long bone more than the vertebral, skull, ribs and pelvis. The organs most commonly affected include the lungs, gastrointestinal tract, and myocardium.8 Clinical appearance is variable and non-specific, leading to frequent misdiagnosis, although most patients present with well-circumscribed firm nodules. Various forms had been described as atrophic depressed, cystic and transilluminated, polyoidal,9 plaque-like10 or even warty pedunculated lesions.11 Lesions in multicentric form usually have a similar appearance and there may be several to more than 100. In our patient, the subcutaneous cystic lesion in the left occipital area seen on the imaging studies is considered as a rare clinical variant of IM. Most cases are sporadic and familial cases are rare, but autosomal-dominant and recessive inheritances have been reported.12-15 Stenman et al.16 reported an interstitial deletion of 6q (del(6)q12q15) detected in the tumor of a 6-month-old infant.

If there is no visceral involvement, solitary lesions and multiple lesions in infants usually have a benign and self-limited course. Most of them end up in spontaneous regression. The recurrence rate after excision is less than 10%.5 In the multicentric form, when lesions are limited to the skin and bones, the prognosis is excellent with 60% of cases spontaneously regressed during follow-up periods of 1-2 years.7 Although there has been no documentation describing the mechanism of the spontaneous regression of IM, Fukasawa et al.17 postulated that massive apoptosis was responsible. However, visceral lesions are associated with significant morbidity and mortality generally within the first few months of life secondary to obstruction of a vital organ, failure to thrive or infection.8 According to Wiswell et al.,3 73% of such patients died, mostly of cardiopulmonary failure.

Current therapeutic options include conservative management with close follow-up, surgical resection and chemotherapy. Surgery is recommended only if vital structures are affected or if tissue is needed for diagnosis. A few patients with generalized IM, widely disseminated musculoskeletal disease, recurrent or nonresectable tumors have been treated with some success with a combination of low-dose chemotherapy with interferon-alpha, vincristine, actinomycin-D, methotrexate and 2-chlorodeoxyadenosine.18,19

In general, infantile myofibromatosis is the most common fibrous tumor of infancy and must be considered when evaluating children who present with either solitary or multiple tumors, particular during the neonatal period. And since visceral involvement has been documented in patients with multiple lesions, careful and complete evaluation of these patients,
including a thorough family history, skeletal survey, chest x-ray, echocardiography, computer tomography or magnetic resonance imaging of the thorax and abdomen, is necessary. Genetic counseling for the possibility that further children and successive generations may be affected is recommended. Besides, periodic clinical and radiological re-evaluation is warranted in all case of IM until the condition is stable.

REFERENCES