Neurofibromatosis clinical presentations: a report of 2 cases

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Neurofibromatosis (NFT) is an autosomal dominant disorder. Several distinctive clinical features may be discovered in the presence of the disease, including 'café au lait' spots, cutaneous neurofibromas, axillary freckling, Lisch nodules, and a positive familial history.

Chiropractic management of this condition should include early recognition, appropriate supportive referral and symptomatic treatment of accompanying biomechanical dysfunctions. Early diagnosis will not only permit appropriate assessment, but will allow for vital genetic counselling.

KEY WORDS: neurofibromatosis, chiropractic, manipulation.

La neurofibromatose est un trouble autosomique majeur. Plusieurs caratéristiques cliniques distinctives peuvent être observées en présence de cette maladie, dont les taches "café au lait", des neurofibromes cutanés, des taches de rousseur axillaires, des nodules de Lisch et des antécédents familiaux reconnus.

Le traitement chiropractique de cette condition devrait inclure la détection précoce, une référence d'appui appropriée et le traitement symptomatique des malfonctionnements biochimiques. Le diagnostic précoce permettra non seulement une évaluation adéquate, mais aussi d'entreprendre une consulation génétique vitale.

MOTS CLÉS: neurofibromatose, chiropractie, manipulation.

Introduction

Von Recklinghausen (1882) first coined the tern "neurofibromatosis", but it was Sir Frederick Treves' (1884) presentation of John Merrick, "the Elephant Man", that most widely publicized this condition.[1]

The prevalance of this disease extends from 1 per 2,000-3,000 live births with almost 100% penetrance and marked variable expressivity. The involvement of a single locus with multiple alleles and several gene loci has been postulated and support of this is enhanced by the increased variability and multiplicity of clinical presentations.[1] These genetic aberrances have been known to affect the neuroectodermal, mesodermal and ectodermal tissues.

Classification systems divide this condition into three general categories of involvement: 1) the historical form which is typified by the peripheral variety as described by Von Recklinghausen. It's clinical presentation includes numerous café au lait spots and subcutaneous neurofibromas; 2) a central variety which is characterized by central nervous system manifestations including bilateral acoustic neuromas; and 3) the rarest variety being the segmental form which confines itself to one side of the body or a singular dermatome.[1,2,3,4]

Clinical presentations

1 Cutaneous Lesions

a) *Cafe au Lait Spots (89-91% incidence):*
These are tan macular hyperpigmentations displaying irregular shape and variability in size, typically found on the trunk, in the axilla, and over the pelvis.[5] Similar lesions may be observed on patients with fibrous dysplasia, however, to be diagnostic of NFT there must be a minimum of five sites with at least one measuring greater than 1.5 cm in diameter. These may display size alterations with maturity.

b) *Neurofibroma (12-18% incidence):*
These represent benign nodules arising from the dermis. They typically occur after puberty and are rarely associated with central nervous system or skeletal lesions. They may present as smooth lobulated, soft or firm, skin elevations and are frequently asymptomatic.

c) *Other cutaneous manifestations:*
i) Nevi, (fewer than 6%) represent patches of hyperpigmentation which tend to be unilateral and are very sensitive. The sensitivity may indicate an underlying subcutaneous plexiform neurofibroma. These lesions, when present, are reported to have an increased incidence of malignant degeneration.[1,2,4]
ii) Axillary freckling (Crowes Sign) represents diffuse small (2-3 mm diameter) hyperpigmentations within the axilla. This sign is observed in 20-30% of patients with NFT.[1,4]
iii) Puritus has been reported in patients with or without cutaneous signs of NFT.[1,2,4]
iv) Extremes of cutaneous signs may manifest as elephantiasis and verrucous hyperplasia.

d) *Other systemic signs:*
These may include but are not necessarily limited to Lisch nodules about the iris of the eye and multi organ system involvement.

Although the ophthalmalogic community has observed a 94% incidence of Lisch nodules, which represent pigmented hamaratomas of the iris, in patients with NFT this sign has not been universally accepted as a pathognomonic diagnostic entity of this time.[2]

2 Familial history

A positive familial history of NFT has been reported in

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45-48% of individuals diagnosed as having NFT. The reliability of this factor is affected by the fact that spontaneous mutations still account for a large percentage of initial presentations.

3 Characteristic radiographic manifestations
   a) *Hemihypertrophy:*
   Giantism has been associated with NFT, however, no incidence has been offered to indicate its diagnostic importance. The changes may include hemihypertrophy of the skull and face.[6] These skull and facial features may also be dysplastic in origin resulting in an absence of certain anatomical structures most notably the sphenoid and orbital elements.[4]
   b) *Spinal deformity:*
   Several radiographic features have been observed in patients with NFT. These include enlargement of intervertebral foraminae ("dumbell tumors"), posterior vertebral body scalloping,[7] transverse process spindling and apical rib "penciling". Scoliosis has also been known to occur as a result of this disorder with an incidence of 10 - 60%.[1,7] However, this incidence has not been separated into primary (dysplasia concomittant with NFT) or secondary (idiopathic) causes. The characteristic presentation is that of a kyphoscoliosis of the lower thoracic spine, with a short (5 vertebrae or fewer) sharply angulated curve.[8,9] Sequelae to the above deformities must also be considered in the management and assessment of NFT when they are coexistent.
   c) *Congenital pseudoarthroses:*
   This has also been found to arise most commonly in the tibia. It may also appear as anterolateral bowing which is usually evident by the first year of life.[1]

Diagnostic considerations

A diagnosis of NFT may be rendered when two of the following four most common "criteria" are present. These criteria are: 1) cafe au lait spots; 2) positive family history; 3) neurofibromas plus or minus positive biopsy; 4) characteristic osseous lesions. When any two of the above findings are present in any patient, further confirmation of the disease should be sought.[1]

Case 1

Mr. P.G., a 31 year old caucasian male, presented to the CMCC Crossways Clinic complaining of low back pain which was severe enough to produce an antalgic posture. The patients history suggested a tendancy to a complex variety of transient symptoms of approximately 6 years duration. These included; right shoulder, upper thoracic and right upper rib pains, low back discomfort, left forearm and right leg pain. With the exception of a childhood compound fracture of the left forearm there was no pertinent history associated with the above noted complaint.

Examination revealed several large macular pigmentations of the skin, primarily located over the posterior portion of the trunk and pelvis (figure 1). Multiple soft, bluish nodular lesions most prevalantly observed on the trunk (anterior and posterior) and upper extremities bilaterally were also noted upon inspection (figures 2, 3, 4).

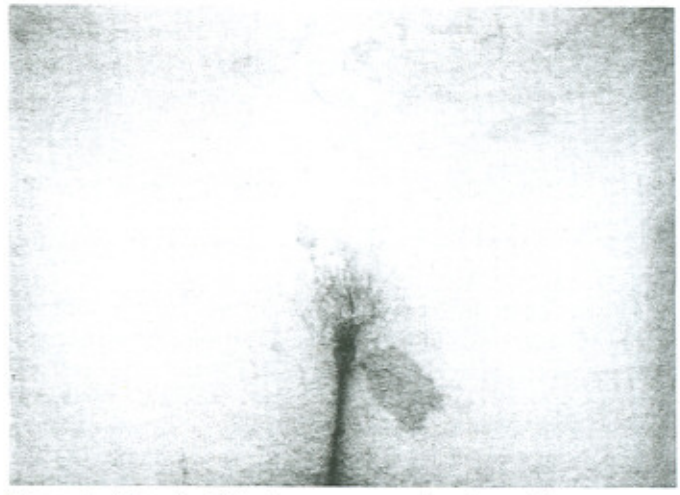

Figure 1 Classic clinical appearance of cafe au lait spots seen adjacent to the gluteal cleft and lumbar spine. Note the larger hyperpigmentation exceeds 1.5 cm in diameter.

Radiographic evaluation of the pelvic region revealed the presence of a transitional lumbo-sacral segment with bilateral pseudoarthrosis. An incidental spina bifida at S1 was also observed in an otherwise normal study of this region.

Although the patient demonstrated biomechanical disorders amenable to chiropractic care, a suspicion of NFT was raised due to the presence of the seemingly characteristic skin lesions ie. cafe au lait spots and cutaneous nodules.

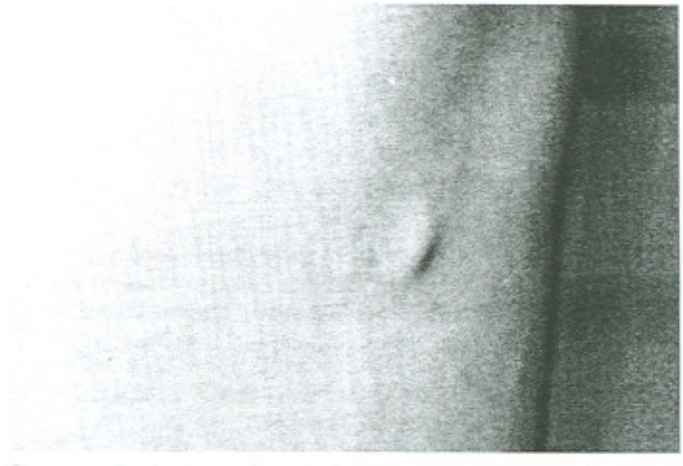

Figure 2 Typical neurofibroma formation suggesting the subcutaneous nodular pattern.

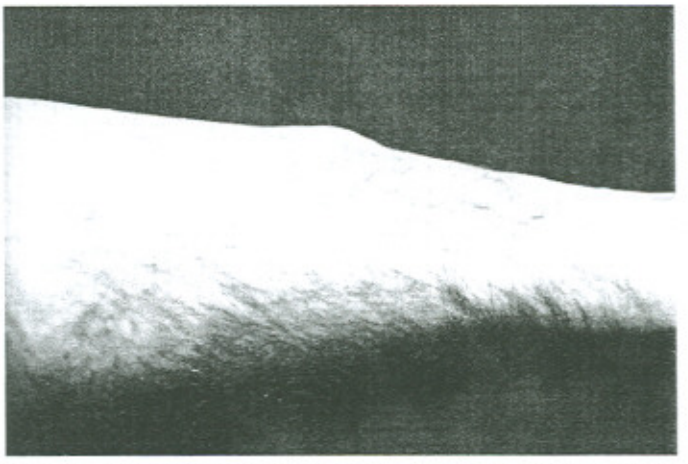

Figure 3 Note the raised appearance of a second larger subcutaneous neurofibromatous nodule on the dorsum of the right forearm.

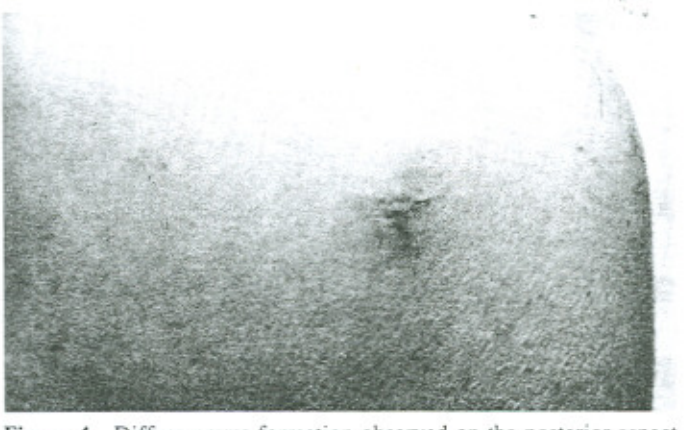

Figure 4 Diffuse nevus formation observed on the posterior aspect of the right shoulder.

Consultation with a neurologist was arranged in order to verify this consideration. The patient was subsequently referred to a dermatopathologist for a nodular biopsy. The histological examination disclosed "a rather pedunculated tumor in which there is a proliferation of elongate type spindle cells present in the dermis dispersed in a loose areolar stroma. Blood vessels are dilated and there is a scattering of mast cells throughout the lesion. The appearance is compatible with neurofibroma."

Concurrent with the consultants' evaluation the patient was treated for symptomatic relief of his biomechanical dysfunction. Adequate counselling, upon confirmation of this disorder, was provided to aprise the patient of the potential future familial consequences.

It was during the second session that the discovery of two additional clinical features was made, 1) a palpable soft tender area over the right temple, posterior to the orbit, and 2) axillary freckling. (figure 5)

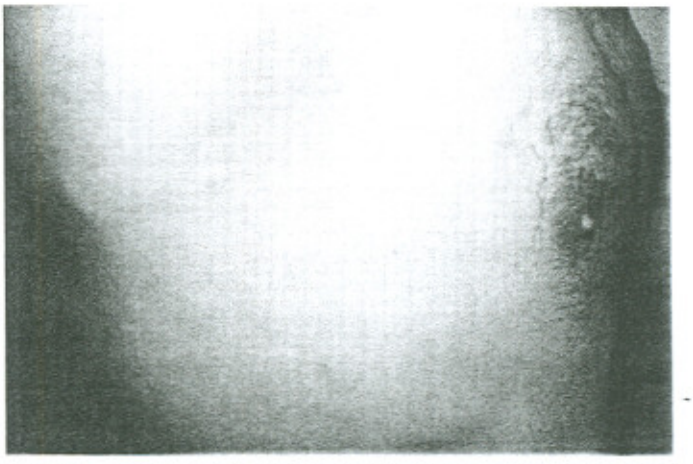

Figure 5 Axillary freckling (Crowes sign) as observed in 20-30% of patients with NFT.

Appropriate additional radiographic studies were conducted in an attempt to classify the precise expression of the NFT. In this case no accessory articulations were demonstrated in the lower limbs. No disclosure of osseous or soft tissue abnormality was demonstrated within the cranium, particularly in the region of the sphenoidal structures. Visible lateral deviations within the spine were nominal in proportion and could not be directly attributable to the condition under the investigation.

The patient is currently engaged in a prophylactic care program which permits continued monitoring.

Case 2

S.O. is an eight year old male. His parent brought him into the clinic to have a possible scoliosis evaluated. A consultant had

Figure 6 Clinical features exhibiting the obvious deformity of the right first ray as compared with the normal left.

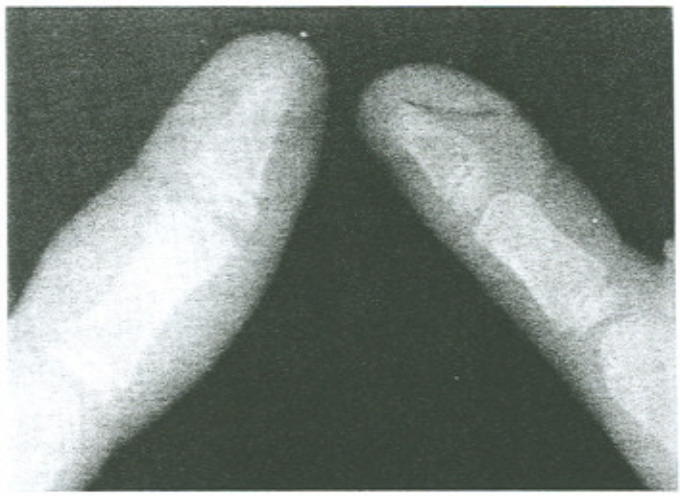

Figure 7 Radiographs of the thumbs. Note the focal hypertrophy of the right proximal phalanx as well as the marked adjacent soft tissue thickening.

previously diagnosed the child as having NFT and it was the incidence of scoliosis which accompanies the disease which concerned the parent.

On physical examination, which included forward and side bending as well as postural analysis, the child was found to exhibit a mild right postural scoliosis. Several regions of skin discolorations in the form of cafe au lait spots were noted. Epulis markings (gingival hyperplasia) on the teeth and a focal increase in size of the right proximal phalanx of the first ray was also seen. (figure 6)

Fibrotic nodules were found on various regions of the body most notably a lesion over the left posterior occipital region measuring 5 cm in diameter. All of these were tender to digital pressure with the degree of tenderness being proportional to the nodular size.

Radiographic evaluation of the spine and right hand revealed a minimal right thoracolumbar scoliosis. Findings consistent with focal giantism of the right first phalanx of the thumb were also demonstrated. (figure 7) Chiropractic care was instituted and directed toward symptom amelioration. Care consisted of spinal manipulative therapy and postural counselling on a monthly schedule.

Summary

As with the above cited cases it becomes apparent that in the patients best interests, early and accurate diagnosis of this disorder is vital to proper management. Due to the wide variability of clinical presentations, any primary health care practitioner may encounter this disorder.

Diagnosis with appropriate consultation and symptomatic management allows for monitoring of possible disease progression and required counselling.

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