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A RARE CASE OF NEUROFIBROMATOSIS RECKLINGHAUSEN (PLEXIFORM TYPE)

by

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Typical cases of multiple neurofibromatosis of *Recklinghausen* are easy to diagnose from a clinical point of view. The monosymptomatic cases can also be easily diagnosed if they occur in patients with hereditary backgrounds. However, unusual localization in both types may render the diagnosis difficult. The case to be described in this paper is an example of unusual localization in the head, neck, and oral cavity. From the view point of differential diagnosis, the dentist should be familiar with the disease in its oral manifestation.

REPORT OF CASE

Case History

The patient is a 9-year-old boy. No cases of neurofibromatosis have been known in the family. The mother gives the following information: As early as the boy could raise his head by himself, an asymmetry of the face was discernible. At the same time an enlargement of the tongue was noticed. At the age of 21 months the patient was referred to a hospital for tuberculosis. The examination revealed at the right side of the head an enlargement of the angular lymph node and the submaxillary gland. The only treatment consisted of light therapy. When the patient was 6 years old the Radium Hospital in Copenhagen was consulted and it was decided to let a certain time elapse before treatment be given. As, however, the boy felt embarassed on account of his large tongue and was teased by the other boys about the deformity of his face, he was hospitalized (Department of Head

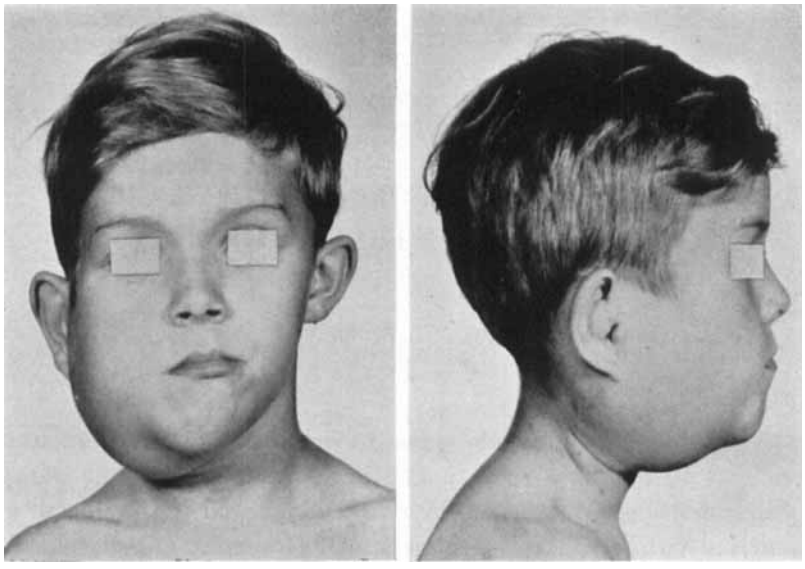

Fig. 1. Photographs of the 9-year-old boy with *Recklinghausen's* neurofibromatosis taken before the operations.

and Neck Surgery, University Hospital)[1] for surgical treatment. During the last two years his hearing decreased without symptoms of catarrhal middle ear disease.

Clinical examination

The boy has a great swelling of the right side of the face and neck, Fig. 1. The swelling, comprising the parotid and the submaxillary regions, pulls down the contours of the face. The lower border and the angle of the lower jaw are hereby camouflaged. The swelling being very indistinct in its delimitation extends anteriorly into the cheek and down the neck, Fig. 1. Behind and below the swelling, level with the middle of the cervical column, some smooth tumors, the size of hazel nuts, can be felt. The skin covering the affected area is not warm. The consistency of the compressible swelling is peculiar due to some rather firm gland-like areas which may be cystic formations.

[1] The authors are indebted to professor *E. Husted*, M.D. for kind permission to publish the case.

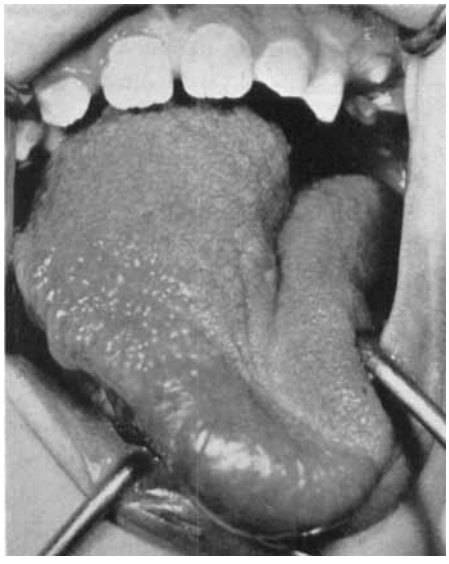

Fig. 2. Photograph of the tongue taken before the operations.

A diffuse swelling can be seen on the right side of the tongue, Fig. 2, causing difficulty in moving it and making speech indistinct.

The facial nerve demonstrates a decreased reaction for the branch innervating the right side of the mouth. After the operations (see later), a partial, peripheral paralysis of the right facial nerve was noted, the boy still being able to close his right eye although with less power. There is right side deafness. The other cranial nerves show nothing abnormal.

About 20 flat café au lait spots, one centimeter in diameter are scattered all over the body. Apart from the spots, the skin is normal except for a small nodule in the region of the left sacroiliac articulation, the nodule being well demarcated, movable and covered with unpigmented skin. The nodule has been present as long as the mother remembers and has not increased in size.

Dental examination

The dental examination made in the Dental Clinic, University Hospital, shows the presence of the following teeth:

6 V 4 2 1	1 2 III 4 V 6
6 III 2 1	1 2 III 6

The dentition corresponds well to the age. The teeth are well preserved and there are no symptoms of disturbances in tooth formation. The alveolar process and the mandible on the right side are thickened.

Radiographic examination

The radiograms of the cranium taken from different angles demonstrate a slight asymmetry but otherwise no osseous abnormalities. Corresponding to the right cheek and the right side of the neck a considerable swelling of the soft tissue is found. Roentgenologically the case is considered a lymphangioma colli.

Treatment

The first operation consisted of a resection of the tumor tissue of the head and neck. Under general anesthesia the tumor of the neck is exposed and through dissection of the angular and submaxillary regions the submental region is reached. During the course of the operation large masses of tumor tissue are removed and it is noticed that the tumor tissue reaches into the floor of the mouth, the tongue base and also extends down the neck. These areas are left untouched.

Postoperatively, the patient has trouble keeping his tongue inside his lips — four centimeters are left protruding. Two months after the first operation two-thirds of the right side of the tongue are resected. Four months after this resection, the tongue is a good deal smaller, but the apex is still protruding between the lips, which makes yet another resection necessary. Although the cosmetic result is not yet satisfactory, the plastic surgeon is very reluctant to suggest any more operations because the result is uncertain.

Histological examination

The tissue removed at the operations has been embedded in paraffine and stained with hematoxylin-eosin, van Gieson's con-

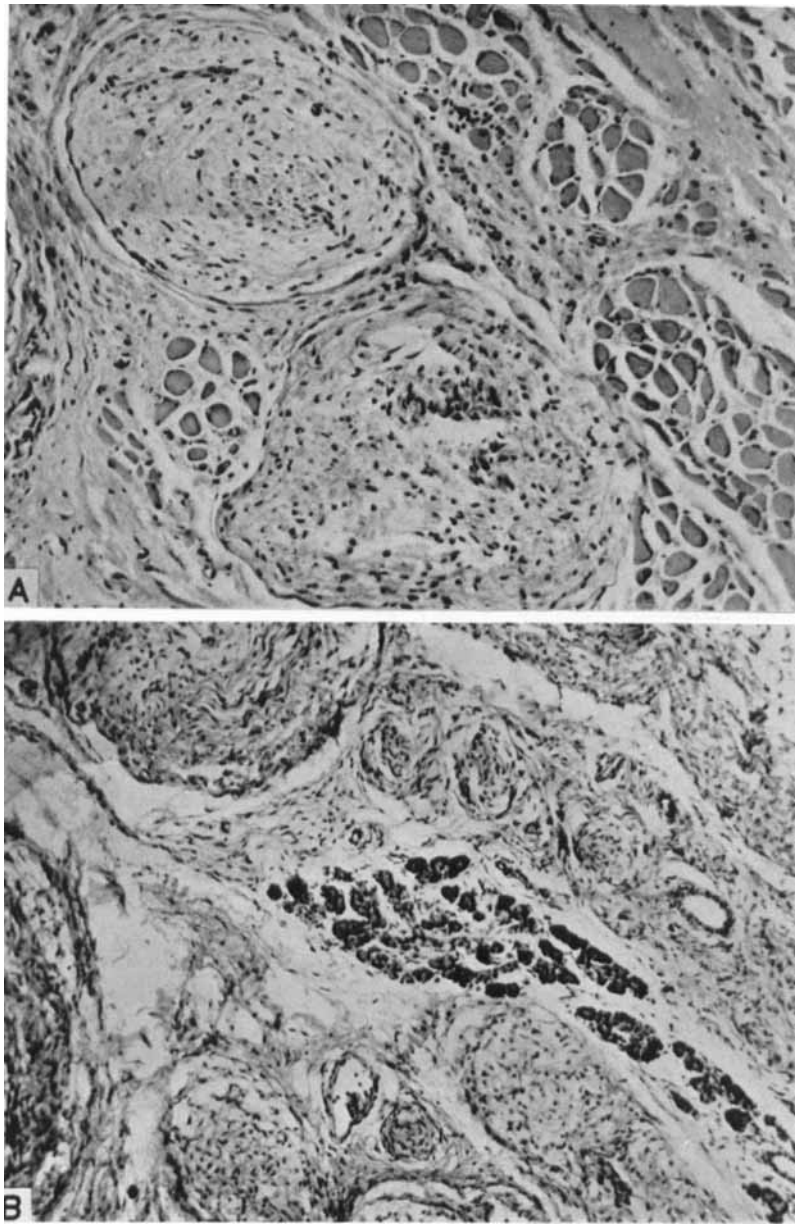

Fig. 3. Photomicrographs of neurofibrils infiltrating the muscles (A) and salivary gland tissue (B). A: Hematoxylin-eosin stain; magnification: ×110 B: van Gieson's connective tissue stain; magnification: ×85.

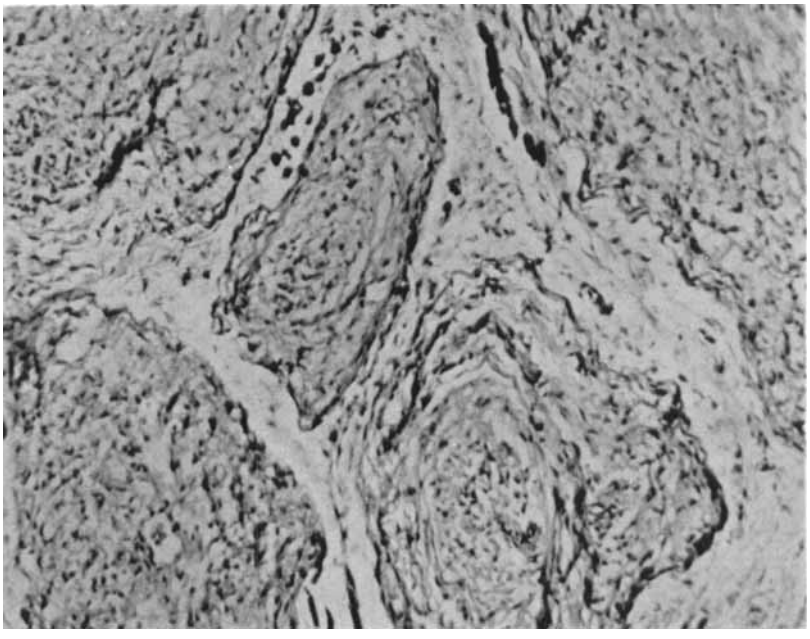

Fig. 4. Photomicrograph of proliferating abnormal neurofibril bundles. Only fragments of myelin sheaths are seen. Weil's myelin stain; magnification: ×110.

nective tissue stain, Mallory's connective tissue stain, and Weil's myelin stain.

The histological examinations of the tissues from the three operations reveal the same picture. Either musculature or salivary gland tissue is infiltrated with bundles of neurofibrils, Fig. 3 A and B. In this abnormal tissue there are plenty of unmyelinated neurofibrils and only a few myelinated neurofibrils. Furthermore, proliferations of the *Schwann's* cells and of the endo- and perineurium can be seen. The proliferations from the perineurium form thick, concentric layers around the abnormal nerves, Fig. 4. Early degenerative changes in the cells of *Schwann* are seen, but no mitosis or multinucleated cells. The supply of vessels is moderate. The walls of the vessels are normal, only in one artery a thickening of the intima is noted. There are no signs of malignancy. *Histological diagnosis: Neurofibromatosis Recklinghausen (plexiform type).*

DISCUSSION

As the histological examination showed, the case in question is a *Recklinghausen's* neurofibromatosis. The disease in this rare case has its origin in the facial nerve which exhibits proliferations of neurofibrils, *Schwann's* cells and the endo- and perineurium.

The histological picture in this case is so characteristic that differential diagnostic considerations are almost superfluous. Nevertheless, it should be mentioned that *Stout* in an extensive paper on juvenile fibromatosis in 1954 described a 30 months old boy suffering from fibromatosis of the desmoid type with exactly the same localization as in the present case. The histological structure is, however, different, because in *Stout's* patient there is a question of proliferation of the interstitial connective tissue. This tissue, lying in looser and firmer strokes, infiltrates the muscles without involving any nerve elements.

According to *Borberg,* 1951 the neurofibromatosis Recklinghausen is a rare disease. Exact figures for the incidence are not available for among other things many patients never seek medical or dental advice. In 1918 *Reiser & Davenport* calculated that roughly one out of 2 000 patients seen in skin clinics presents multiple neurofibromatosis. *Penrose,* 1938 found six cases of neurofibromatosis among 1 280 mental defectives.

The incidence of oral manifestations in neurofibromatosis Recklinghausen is very low. *Borberg,* 1951 found only five cases (6 per cent) with tumors in the oral cavity out of a total of 84 patients. *Baden et al.,* 1955 analysed forty-two cases from literature about patients suffering from oral manifestations of neurofibromatosis. The analysis indicates that the tongue is most frequently involved and presents three clinical forms: 1) macroglossia, 2) enlargement of the papillae, scrotal tongue, 3) isolated or multiple tumors (usually located at the margins or dorsum). In six cases the tongue lesions were associated with other intraoral lesions. However, the combination of tongue-submaxillary gland infiltration seems to be reported only in a few cases. *Martin & Graves,* 1942 described two patients one of which suffered from the disease in a mild and slowly progressive form showing complete replacement of the submaxillary and the sublingual glands with tumor tissue.

With regard to abnormalities in the alveolar bone and teeth reports in the literature are rather inconclusive. In growing children the pressure from the tumor masses may deform the dental arches and sometimes lead to disturbances in the eruption of teeth. Furthermore enamel hypoplasia, premature eruption of teeth, and a high caries incidence have been reported as being connected with Recklinghausen's neurofibromatosis. It is surprising that the case described here does not show any sign of disturbances in tooth formation considering the deformity of the head developed only a few months after birth.

The prognosis for the patient is rather poor. According to *Hoekstra,* 1921 and *Gartner,* 1940 malignant degeneration occurs in 13 per cent of all cases of Recklinghausen's neurofibromatosis and twice as frequently in men as in women. Although no histological signs of malignancy are shown in our patient there has been a slow, but steady growth of the tumor almost from birth till the present time. It has been impossible to remove the tumor completely due to its infiltrative growth in the submaxillary and submental regions. A continuous growth is probable and a malignant transformation into neurogenic fibrosarcoma is likely to occur.

In *Martin & Graves'* second case the local tumor in the mouth and neck took on malignant, locally invasive characteristics and caused death. According to the same authors it has been observed that when the disease extends through several generations, it often has a tendency to occur at an earlier age and to become more severe with each reappearance.

SUMMARY

A case of neurofibromatosis Recklinghausen in a 9-year-old boy is reported. The boy had café au lait spots on the skin of the body and right side of the face, and his tongue exhibited a large diffuse swelling, Fig. 1 and 2. A partial resection of the tumor masses was performed in three operations. The histological examination revealed a heavy infiltration with neurofibrils, in a plexiform pattern, into the muscles and submaxillary gland, Fig. 3. The prognosis with regard to malignant transformation is discussed.

RÉSUMÉ

UN CAS PEU FRÉQUENT DE NEUROFIBROMATOSE DE RECKLINGHAUSEN (TYPE PLEXIFORME)

L'auteur rapporte un cas de neurofibromatose de Recklinghausen chez un garçon de 9 ans. Sur le corps se trouvent de nombreuses taches café au lait, et la moitié droite du visage et de la langue sont dominées par une augmentation diffuse de volume, fig. 1 et 2. L'ablation du tissu tumoral est pratiquée en trois opérations, l'extirpation totale est cependant impossible. L'examen histologique montre la structure typique de la neurofibromatose de Recklinghausen; le tissu musculaire et le tissu des glandes salivaires sont le siège d'une infiltration diffuse de neurofibrilles disposées en réseau plexiforme, fig. 3. La coloration spéciale montre des fragments de gaines de myéline, fig. 4. Discussion du pronostic quant à une dégénérescence maligne.

ZUSAMMENFASSUNG

EIN SELTENER FALL VON NEUROFIBROMATOSIS RECKLINGHAUSEN (PLEXIFORMER TYPUS)

In obigem Bericht wird ein seltener Fall von neurofibromatosis Recklinghausen (plexiformer Typus) bei einem 9-jährigen Knaben beschrieben.

Am Körper wurden zahlreiche weisslich-bräunliche Flecke (café au lait) gefunden. Auffällig war eine diffuse Schwellung der rechten Gesichts- und Zungenhälfte, (Abb. 1 und 2). Es wurde versucht, das Tumorgewebe im Zuge dreier Operationen zu entfernen, was jedoch nicht restlos gelang. Der mikroskopische Befund weist die für neurofibromatosis Recklinghausen typische Struktur auf. Muskel- und Speicheldrüsengewebe sind von Neurofibrillen plexiformer Art durchsetzt, (Abb. 3). Mit Hilfe spezieller Färbung wurden Trümmer von Myelinscheiden nachgewiesen, (Abb. 4). Hinsichtlich der Prognose wird die Frage der Möglichkeit einer malignen Entartung erörtert.

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