**Neurofibromatosis (NF1)**

By Karyna Balytska

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**Overview**

 “Neurofibromatosis is a condition which usually presents by changes in skin coloring or (pigmentation) and the growth of tumors along nerves in the skin ,brain and other parts of the body.”

Neurofibromatosis occurs in 1 in 3000 to 4000 people worldwide. Neurofibromatosis skin lesions are typically flat, pigmented patches but occasionally are elevated flesh-colored bumps.

**Etiology**

 Mutations in the NF1 gene cause neurofibromatosis type 1. The NF1 gene is responsible for production of protein neurofibromin which act as a tumor suppressor. Neurofibromin is produced mainly in nerve cells and specialized cells (oligodendrocytes and Schwann cells). If mutations in a gene occur it affects the function of the neurofibromin and it is no longer capable of regulating cell growth and division. Neurofibromatosis type 1 is an autosomal dominant pattern of inheritance. In 50% of cases the altered gene is inherited from an affected parent the other 50% get a disease without history.

**Clinical Presentation**

-Six or more café-au-lait spots on the skin

-Freckling under the arms or in the groin area

-Presence of pea-sized bumps (neurofibromas) on/just under the skin

-Pigmented bumps on the eye’s iris (Lisch nodules)

-Larger areas on/under the skin that appear swollen

-Skeletal abnormalities, such as bowing of the legs, thinning of the shin bone, scoliosis

-Tumor on the optic nerve that may interfere with vision

**Demographic**

Usually diagnosed in childhood but equal chances of occurring in males as in females, all ethnic groups and races.

**Biopsy / Histology / Radiographs**

Soft tissue incision biopsy is needed.

Histology: not encapsulated; cellular fibrous appearance reminiscent of nerves.

MRI can be done to determine exactly where the tumor is located, its size, and if it is invading other tissues.

Genetic testing to assess NF1 mutations

**Differential Diagnosis**

Other forms of neurofibromatosis

- Segmental/mosaic NF1

-Watson syndrome

-Autosomal dominant multiple café au lait patches alone (some allelic with NF1)

- Neurofibromatosis 2

-Schwannomatosis

Other conditions with café au lait patches

-McCune–Albright syndrome

-DNA repair syndromes

-Homozygosity for one of the genes causing hereditary non‐polyposis cancer of the colon.

Conditions with pigmented macules confused with NF1

- LEOPARD syndrome

-Neurocutaneous melanosis

-Peutz–Jeghers syndrome

-Piebaldism

Localised overgrowth syndromes

-Klippel–Trenauny–Weber syndrome

-Proteus syndrome

Conditions causing tumours confused with neurofibromas

-Lipomatosis

-Banayan–Riley–Ruvalcuba syndrome

**Treatment**

 Surgical excision for a single lesions, often not successful for multiple lesions.

Even though there is currently no cure for Neurofibromatosis, surgical excision for a single lesions may help to relieve the symptoms. (often not successful for multiple lesions). More advanced cases may require chemotherapy or radiation therapy.

**Prognosis**

 Depending on severity of condition and type of treatment rendered in individuals diagnosed with Neurofibromatosis life expectancy is almost normal but is lower than in the general populations by approximately 15 years.

**Professional Relevance**

 Most of the systemic conditions have oral manifestations. Neurofibromatosis is not an exception. The neurofibromas in oral cavity most commonly involves the tongue. Other affected sites include lips, palate, buccal mucosa, gingiva, floor of the mouth or the pharynx. Neurofibromas of the tongue are nearly always nodular.Macroglossia and enlargement of filiform papillae may also be noted. Most of the time neurofibroma is not found on the surface of the gingiva but still rarely it occurs and may in fact be confused with periodontal disease or cause periodontal disease, because tissue growth impedes access to dental surfaces and is an obstacle to proper oral hygiene.

 As a healthcare professional I am responsible for the patients health and well- being . The goal of assessments is to build rapport with the patient and collect information based on which we will design the care plan with the respect to dental hygiene diagnosis. A lot of times serious conditions are left undetected because clinicians fail to do proper examination and inspection of the head and neck. Patients mostly are simply not aware of the conditions that they might have. Whether the lesion is benign or malignant, patient has a right to be informed about it and get professional opinion of the specialist. Our level of education allows us to make a scientific claim and document it accordingly. Potentially we become a bridge builder between the patient and the doctor to which we plan to refer for further evaluations and testing.

 Linking our clinical observations with theoretical knowledge about disease is critical for diagnosis. By early detection and adequate diagnosis we can save life of a lot of patients, because thorough examination and trained eye will provide the opportunity to diagnose NF.

**Citations**

1.Abramowicz A, Gos M. Neurofibromin in neurofibromatosis type 1 – mutations in NF1gene as a cause of disease. Dev Period Med. 2014 Jul-Sep; 18(3): 297-306.

2.Boyd, K. P., MD, Korf, B. R., MD, & Theos, A., MD. (2008, October 10). Neurofibromatosis Type1. Retrieved November 5, 2018, from<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2716546/>

3.Cunha KSG, Barboza EP, Dias EP and Oliveira FM. Neuro bro- matosis type I with periodontal manifestation. A case report and literature review. Br Dent J. 2004;198:457-460.

4.Ferner, R. E., Huson, S. M., Thomas, N., & Moss, C. (2006, November 16). Guidelines for the diagnosis and management of individuals with neurofibromatosis 1. Retrieved November 5, 2018, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2598063/

5.Friedman JM, Gutman DH, MacCollin M, Riccardi VM. Neurofibromatosis: Phenotype, Natural History, and Pathogenesis (3rd Edition). Baltimore, MD and London, England: Johns Hopkins University Press; 1999.

6.Geist JR, Gander DL, Stefanac SJ. Oral manifestations of neurofibromatosis types I and II. Oral Surg Oral Med Oral Pathol. 1992; 73:376-382.

7.Neurofibromatosis type 1 - Genetics Home Reference - NIH. (2018, October 30). Retrieved November 5, 2018, from<https://ghr.nlm.nih.gov/condition/neurofibromatosis-type-1>

8.Shapiro SD, Abramovitch K, Van Dis ML, Skoczylas LJ, Langlais RP, Jorgenson RJ, et al. Neuro bromatosis: oral and radiographic manifestations. Oral Surg Oral Med Oral Pathol. 1984;58:493- 498.

9.Short MP. Neurofibromatosis Type 1. In: NORD Guide to Rare Disorders. Lippincott Williams & Wilkins. Philadelphia, PA. 2003:563-64.

**Appendix**

