Paget's Disease of the Jaw Bones

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Paget's disease of the jawbone is a chronic disease leading to rapid bone resorption and excessive bone formation (Campolongo et al). In other words, bone is being created and destroyed at the same time. This leads to the weakening and change in appearance both clinically and radiographically. It was first discovered by Sir James Paget in 1876 who documented the bony enlargement of the skull of his patients (Siddiqui et al). Its original name was Osteitis deformans by Sir James Paget and also named Paget's disease (Amaya et al., 2021). This disease may be present in different areas of the body with one of the most common areas being the skull. There may be monostotic Paget's disease, involving a single bone; or polyostotic Paget's disease, involving multiple bones (Amaya et al., 2021). Osteoblastic activity increases leading to sclerosis and deformities of the bone (Amaya et al., 2021) leading to many common characteristics of the disease that we will discuss further in depth.

Although there is no exact official reported cause of Paget's disease, it is likely linked to a paramyxoviral infection which is known as a slow virus in genetically susceptible individuals (Kravets, 2018). It is known as a matrix madness disorder because of the amount of bone resorption and formation being produced. There seems to be a genetic predisposition with Paget's disease, as well as underlying conditions that may increase the likelihood of occurrence and environmental factors. Because of the reduction in appearance and prevalence over the years, it's exact underlying cause still remains misunderstood. Studies have shown a presence of a viral protein coat of the measles virus in patients with Paget's disease, giving a possible correlation and explanation of its prevalence of less than 5% of the population (Appelman-Dijkstra & Papapoulos, 2018). It has been shown that Europe had a 300% increase in measles resurgence in 2019 despite having a high vaccination coverage (Leona & Wilder-Smith, 2019).

Some patients may be asymptomatic, but individuals may experience a shift in dentition, including a change in the way they may bite. They may complain of pain in the hips, knees, and back (Appelman-Dijkstra & Papapoulos, 2018). Symptomatic patients may also experience irreversible hearing loss when the skull is involved (Appelman-Dijkstra & Papapoulos, 2018). Clinically, the health care professional may observe fractures due to the deformity of the bone. Due to pain and increased risk or presence of fractures, it may also be observed that the patient has a hard time walking. The dental hygiene professional may also observe spaces between the teeth, an increase in the size of the skull, mobility and tooth loss due to Paget's disease (Amaya et al., 2021).

The prevalence of this disease is predominantly occurring in individuals over the age of 50 years old, which is when an individual's chances are doubled. Its cases vary and may occur in women; however, its occurrence is more targeted towards the male gender with a 2:1 ratio. Its incidence has also been recognized most in Europe, such as the United Kingdom and Germany (Amaya et al., 2021).

Depending on the location or area affected, a biopsy of a small area may be needed for further treatment and prevention. The histology appearance of Paget's disease can often be seen as mosaic with osteoclasts and osteoblasts as a result of the resorption and production. Paget's disease may also be detected by radiographs given its unique appearance. Due to the deformity, size and thickness of the bone it may be easier to assess the abnormalities radiographically. Although it may vary with the severity of the disease, radiopacities may be present a cotton wool appearance (Amaya et al., 2021). Paget's disease, although presenting with specific clinical manifestations, share similar symptoms as other conditions, making it difficult to easily narrow it down. Conditions include cemento-osseous dysplasia and medication related osteonecrosis of the

jaw (Amaya et al., 2021). This is where biopsy, radiographs further analysis is needed to determine the pathology present. Its cotton wool appearance and mosaic pattern microscopically

There are currently no cures or ways to prevent Paget's disease in its entirety. Treatment may include Bisphosphonates which can help strengthen bones, aiding in the prevention of fractures and osteoporosis, as well as Calcitonin to help regulate the calcium in the body (Kravets, 2018). Due to the slow progression of Paget's disease, the prediction to develop symptoms or specific manifestations is difficult to narrow down. Its cotton wool appearance on radiographs and physical features such as a barrel chest, hearing loss and the density of the bone can help determine the severity and allow for a proper course of treatment. Early detection also plays a huge role in mandating treatment before it gets worse.

The relevance of this disease on a Dental Hygiene professionals' point of view is number 1, the patients overall health. We want the best for our patients, and we look at more than just the teeth. It's important to be aware of the unique features of Paget's disease which overtime untreated can become complicated. Dental hygienists may also observe the clinical manifestations that can affect the patient's oral health, such as deformity of the bone, the shift in dentition and malocclusion. These things may affect the dentition making it harder to clean, it may destroy the bone or lead to periodontal disease and an increased risk of tooth decay due to incorrect mechanical removal of food debris during mastication. As healthcare professionals it is our job to be able to advocate for our patients even in the slightest abnormality, for the health and proper treatment of our patients.

Citations

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