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Gingival Fibromatosis

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Abstract
Hereditary gingival fibromatosis (HGF) is a rare genetic disorder characterized by progressive, benign gingival overgrowth. This review synthesizes current knowledge on HGF's etiology, clinical impact, and management strategies, with a focus on pediatric patients. Primarily caused by autosomal dominant mutations in genes like SOS1, HGF presents significant functional and aesthetic challenges, including difficulties in mastication, speech, and maintenance of oral hygiene, which heightens the risk of dental caries and periodontitis. Diagnosis requires differentiation from other gingival enlargements and often involves genetic counseling. While surgical intervention via gingivectomy remains the primary treatment to reduce tissue bulk, high recurrence rates are a major concern. Effective long-term management necessitates a multidisciplinary approach, combining surgical care with rigorous oral hygiene and psychological support due to the condition's impact on self-esteem. This review underscores the necessity of early diagnosis, patient education, and further research into targeted therapies to improve quality of life for affected individuals.

Keywords
Hereditary gingival fibromatosis; Gingival overgrowth; SOS1 gene; Gingivectomy; Pediatric dentistry; Multidisciplinary management.

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Summary
A uncommon genetic disorder known as hereditary gingival fibromatosis (HGF) mainly affects children and is characterised by the gradual overgrowth of gingival tissue. This issue is noteworthy because it has a substantial effect on oral health and can result in consequences like speaking difficulties, chewing difficulties, and an increased risk of dental disorders. HGF is a major concern for genetic counsellors and dentists since it is linked to certain genetic mutations, especially in the SOS1 gene, and is usually inherited in an autosomal dominant manner (Wikipedia contributors 2022, February 19; Swaroop, 2024, August 12). Firm, nodular gingival enlargements that can vary in severity are a clinical manifestation of HGF that may impact both the functional and aesthetic aspects of oral health. Dhadse et al. (2012), Diagnosing HGF often requires differentiating it from other gingival enlargement conditions, which calls for extensive examinations by periodontists. The management of the problem is made more difficult by the fact that, due to its genetic origin, affected children may also experience psychological difficulties relating to social relationships and self-esteem (Dhadse *et al.,* 2012; Strzelec et al., 2021). Both surgical and non-surgical methods are used to manage HGF in paediatric patients. Non-surgical approaches stress the value of maintaining oral hygiene and routine dental check-ups to monitor the condition and prevent complications. Strzelec *et al.* (2021) Surgical procedures, like gingivectomy, are commonly used to remove excess tissue, but recurrence is still a major concern. To address the full needs of impacted patients, a multidisciplinary approach is also advised, comprising cooperation between dental specialists and psychological support (Dhadse *et al.,* 2012). Raising awareness of HGF through educational activities is crucial for early diagnosis and successful treatment, highlighting the need of identifying symptoms and comprehending the hereditary foundation of the disorder (Dhadse *et al.,* 2012; [7]. Informed decision-making among families can be facilitated by community outreach initiatives and provider collaboration, which will ultimately improve the health outcomes for kids with this illness (Dhadse *et al.,* 2012; Afonso *et al.,* 2022).

CAUSES
There are a number of variables that contribute to the development of hereditary gingival fibromatosis (HGF), including both genetic and non-genetic causes.

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Factors related to genetics

Hereditary gingival fibromatosis is primarily caused by mutations in the SOS1 gene, according to research. This gene is found on the chromosome.

As a guanine nucleotide-exchange factor, 2p21-p22 is engaged in cell signalling pathways that control differentiation and proliferation. HGF is frequently linked to autosomal dominant inheritance patterns and can also manifest in association with a number of multi-system syndromes, such as Zimmerman-Laband syndrome and juvenile hyaline fibromatosis, among others. Wikipedia contributors (2022, February 19) Furthermore, genetic linkage studies have localised other mutations responsible for different forms of HGF, such as HGF2, to chromosome 5q13-q22. Wikipedia contributors (2022, February 19) Additionally, mutations in the RE1-silencing transcription factor (REST) gene have also been linked to the aetiology of this syndrome.

Non-Genetic Elements

Certain pharmacological substances have been linked to drug-induced gingival overgrowth in addition to hereditary reasons. Although there is little evidence to support this association, medications like phenytoin, ciclosporin, and some calcium-channel blockers can cause HGF-like symptoms. Wikipedia contributors (2022, February 19) Inflammation, hormonal imbalances, and neoplasia are other non-genetic factors that may contribute to the condition. Wikipedia contributors (2022, February 19) Although genetic predisposition plays a major role in HGF, the presence of external factors like medication and health conditions may further complicate the clinical presentation, emphasising the importance of thorough evaluations in affected patients. To control possible development and preserve oral health, routine dental examinations and monitoring are advised, particularly for people with established genetic disorders (Wikipedia contributors 2022, February 19).

CLINICAL CHARACTERISTICS

A progressive expansion of the gingival tissue is the hallmark of hereditary gingival fibromatosis (HGF), which can cause a number of clinical symptoms that have a major influence on children. Gingival nodules and hyperplastic forms are common clinical manifestations, and upon inspection, they may feel firm or even bone hard (Dhadse *et al.,* 2012; Wikipedia contributors 2022, February 19).

Distinctive Diagnosis

Since HGF's clinical characteristics can overlap with those of other gingival enlargements, other conditions that may present similarly should be taken into account while diagnosing HGF. Differentiating HGF from other oral illnesses may be aided by a comprehensive examination performed by a periodontist Wikipedia contributors 2022, February 19).

Signs and Symptoms

Gingival overgrowth, the main clinical manifestation of HGF, can impair chewing effectiveness and make eating challenging (Dhadse *et al.,* 2012). Patients frequently suffer from varying degrees of discomfort in the afflicted areas, which may make it difficult to speak.

As well as lip closure (Dhadse *et al.,* 2012). In extreme situations, the overgrowth may spread to the palatal area, changing the palate's shape and increasing the risk of issues such diastema, malocclusion, and extended primary tooth retention (Swaroop, 2024, August 12; Wikipedia contributors 2022, February 19). Additionally, as the incapacity to maintain oral hygiene becomes a major problem, the condition can lead to plaque retention, increasing the risk of dental caries, gingivitis, and periodontitis (Dhadse *et al.,* 2012). In contrast to other gingival illnesses or enlargement situations, the gingival tissue in HGF exhibits stippling without inflammation (Dhadse *et al.,* 2012).

Genetic Factors

HGF is frequently a genetic disorder that can also lead to psychological difficulties that impact a child's confidence and sense of self (Dhadse *et al.,*

2012). In addition to physical examinations, the existence of genetic abnormalities, like those in the SOS1 gene, has been linked to this illness and may help with diagnosis (Wikipedia contributors 2022, February 19).

PATHOPHYSIOLOGY

Gingival tissue grows abnormally in hereditary gingival fibromatosis (HGF), a disorder that can be caused by a number of genetic and environmental causes. It is frequently linked to autosomal dominant gene inheritance patterns and can result from a number of underlying causes, such as inflammation, hormone imbalances, and neoplasia (Wikipedia contributors 2022, February 19). HGF can also be a component of multi-system disorders, including juvenile hyaline fibromatosis, Jones syndrome, and Zimmerman-Laband syndrome (Wikipedia contributors 2022, February 19).

Factors related to genetics

With an estimated phenotypic frequency of 1 in 175,000 and a gene frequency of 1 in 350,000 for the autosomal dominant variant, HGF can appear in both autosomal dominant and recessive inheritance patterns (Swaroop, 2024, August 12). The illness is hereditary, as evidenced by case studies that show familial occurrences, with a considerable percentage of children impacted in marriages between affected and unaffected persons (Swaroop, 2024, August 12).

Mechanistic Understanding

The disruption of homeostatic balance between the production and breakdown of extracellular matrix (ECM) molecules has been the subject of recent research, with a focus on the functions of growth factors and matrix metalloproteinases (MMPs). Fibroblasts generated from HGF patients have been shown to express lower levels of MMP-1 and MMP-2, indicating decreased breakdown of extracellular matrix (Swaroop, 2024, August 12). Collagen and other matrix materials may also accumulate in the gingival tissue as a result of increased transforming growth factor-beta 1 (TGF-1) and interleukin-6 (IL-6) production, which may also improve the synthesis of ECM components while concurrently decreasing fibroblast proteolytic activity (Swaroop, 2024, August 12).

Clinical Display

Clinically, HGF manifests as a proliferative, nonhemorrhagic gingival lesion with solid, fibrotic tissue that may have a pebbled or nodular appearance. In contrast to other types of gingival enlargement, the expansion is often restricted to the masticatory mucosa and does not extend over the mucogingival junction (Swaroop, 2024, August 12). Gingival fibrosis with myxoid changes has been observed in histological investigations, suggesting notable changes in the architecture of connective tissue (Strzelec *et al.,* 2021). Based on clinical appearances, the disorder can be divided into two forms: the symmetric form, which causes uniform expansion of the gingival tissue, and the nodular form, which has many focal enlargements in the dental papillae (Strzelec *et al.,* 2021). The symmetric type, which affects the maxilla and mandible equally, is more commonly seen, however both forms may coexist (Strzelec *et al.,* 2021).

ADMINISTRATION

Paediatric patients with hereditary gingival fibromatosis (HGF) require a multimodal strategy that is customised for each patient's needs and emphasises both functional and aesthetic factors. A frequent therapeutic strategy used to reduce the symptoms of excess gingival tissue is surgical intervention, specifically gingivectomy.

Surgical Intervention

In order to improve function and appearance, gingivectomy is frequently performed to remove the excessive gingival tissue. A number of methods can be applied, such as the inverted bevel flap approach, which has demonstrated encouraging long-term outcomes. The potential for long-lasting results with this surgical method was highlighted by a case study that documented a successful gingivectomy in a patient who had no discernible recurrence of the fibromatosis after 15 years (Seki & Sato 2022; Wikipedia contributors 2022, February 19). Gingival overgrowth recurrence is still a significant worry, though, as some patients

experience it weeks to months after surgery (Strzelec *et al.,* 2021).

Management Without Surgery

Maintaining rigorous dental hygiene to avoid inflammation and subsequent infections that could worsen gingival overgrowth is one non-surgical therapy strategy that may be used in addition to surgical options (Strzelec *et al.,* 2021). To keep an eye on the condition and treat any difficulties brought on by the fibromatosis, routine dental examinations and professional cleanings are also advised.

Multidisciplinary Method

Managing HGF may benefit from a multidisciplinary approach comprising paediatric dentists, periodontists, and orthodontists. This partnership can address the patient's periodontal health as well as any potential orthodontic concerns.

Because of the displacement of teeth brought on by an excess of gingival tissue (Dhadse *et al.,* 2012). Since repeated surgical procedures can cause psychological discomfort for impacted children and their families, psychological support should also be taken into account (Strzelec *et al.,* 2021).

Extended Follow-up

To ensure continued management of the illness and to keep an eye out for recurrence, long-term follow-up is crucial. To enable them to make well-informed decisions about their child's treatment strategy, parents should be informed on the nature of HGF and the possibility of recurrence (Wikipedia contributors 2022, February 19). Better management results and prompt resolution of any issues can be facilitated by efficient communication between the family and the healthcare providers.

THE STUDY OF EPIDEMIOLOGY

Gum tissue overgrowth is a rare genetic disorder known as hereditary gingival fibromatosis (HGF). With an estimated prevalence of 1 in 175,000 to 1 in 750,000 people, HGF is rare in the general population (Swaroop, 2024, August 12; [7]. This illness can manifest at birth, affects males and females equally, and is not based on race or ethnicity, therefore it can occur in a variety of people around the world [9][1]. Both autosomal dominant and autosomal recessive modes of inheritance exist for HGF, and a strong risk factor for the disorder is family history (Wikipedia contributors, 2023b, December 3; (Wikipedia contributors, 2022, February 19). Notably, a number of studies have documented afflicted individuals spanning several generations, highlighting the fact that it is inherited. The autosomal dominant inheritance pattern that is common in many cases is demonstrated by the fact that, in some families, up to nine marriages between affected and unaffected individuals produced a significant number of affected offspring (Swaroop, 2024, August 12). Furthermore, HGF's epidemiological profile may become even more complex due to its associations with other genetic disorders. Family members frequently exhibit varying phenotypic expressions; data suggest that even closely related people might have different clinical presentations (Strzelec *et al.,* 2021; Swaroop, 2024, August 12). Understanding the genetic basis of the illness and diagnosing it are made more difficult by this heterogeneity (Cunha *et al,*. 2020; Swaroop, 2024, August 12). HGF is a pertinent issue in paediatric dentistry and maxillofacial research because its clinical manifestations, such as gingival overgrowth and its related problems, frequently lead to dental examinations in paediatric patients (Cunha *et al,*. 2020). Therefore, prompt detection and treatment are essential for reducing symptoms and averting other oral health issues.

EXAMPLES OF CASES REPORTS AND CLINICAL OBSERVATIONS

Numerous case studies have been published that demonstrate the clinical manifestation, genetic implications, and management of hereditary gingival fibromatosis (HGF) moves in. A noteworthy example by Suhanya et al. showed the difficulty of treating paediatric patients with many diseases, including cherubism, epilepsy, mental retardation, and gingival fibromatosis (Strzelec *et al.,* 2021). Furthermore, Jones et al. reported a familial example that showed progressive deafness linked to gingival fibromatosis across

five generations, which may indicate an autosomal dominant inheritance pattern (Strzelec *et al.,* 2021). The heterogeneous nature of gingival fibromatosis was further supported by Hartsfield et al.'s examination of a patient who also had sensorineural hearing loss (Strzelec *et al.,* 2021). Additionally, Aghili and Goldani Moghadam's study examined a rare instance of hereditary gingival fibromatosis and offered insights into its therapeutic choices and clinical characteristics [11].

Genetic Knowledge

Important chromosomal areas like 2p21-p22 and 5q13-q22 linked to HGF1 and HGF2, respectively, have been identified by genetic linkage studies, which have also localised genetic loci linked to hereditary types of gingival fibromatosis [7]. These results highlight how crucial genetic research is to understanding the molecular processes underlying HGF and directing future treatment approaches (Strzelec *et al.,* 2021).

Methods of Treatment

Clinicians have used a wide range of therapeutic approaches for HGF, including both conservative and surgical methods. Due to the condition's high recurrence rate, traditional surgical therapies seek to minimise gum overgrowth through operations that frequently involve repeated excisions (Swaroop, 2024, August 12). Compared to traditional surgical techniques, laser therapy has been used in certain documented situations to reduce discomfort and encourage quicker healing. A customised strategy is necessary for an effective treatment plan, considering the patient's particular presentation and the risk of recurrence, especially during puberty when growth spurts may make gum enlargement worse (Swaroop, 2024, August 12; [13]. In order to improve patient results, active orthodontic treatment may also be helpful in correcting misplaced teeth and reducing mechanical stress on the gums (Almiñana-Pastor *et al.,* 2017).

Initiatives for Education and Community Awareness

Increasing knowledge and educating people about hereditary gingival fibromatosis (HGF) is essential for prompt diagnosis and successful treatment, especially for young patients. In order to facilitate prompt consultations with dental specialists, parents and carers should be made aware of the symptoms and possible consequences linked to HGF (Dhadse *et al.,* 2012). The significance of identifying early indicators of gingival overgrowth and being aware of the recurrence rates linked to surgical procedures like gingivectomy should be the main topics of educational campaigns (Dhadse *et al.,* 2012; [7].

Campaigns for Information

Programs for community outreach can be quite effective in spreading awareness about HGF. To educate parents on the problem, its hereditary basis, and possible treatment options, these efforts may involve workshops, seminars, and informational brochures (Afonso *et al.,* 2022). Community programs can offer precise information about HGF and related syndromes by utilising resources from rare disease platforms such as Orphanet and OMIM, as well as genetic databases (Afonso *et al.,* 2022).

Cooperation with Medical Experts

Fostering an informed community requires cooperation between paediatricians, genetic counsellors, and dental health professionals. With an emphasis on the psychological and social aspects of the disorder, healthcare providers can provide advice on when to seek therapy as well as the best ways to manage HGF (Dhadse *et al.,* 2012; Afonso *et al.,* 2022). In order to provide a supportive atmosphere for talking about possible surgical alternatives and long-term management techniques, parents should also be encouraged to actively participate in their child's healthcare decisions (Dhadse *et al.,* 2012).

Resources for Parents and Guardians to Learn

Giving parents access to instructional materials can enable them to actively participate in their child's health. Information about the psychological effects of HGF, the significance of dental hygiene, and the timing of surgical treatments are all included in this (Dhadse *et al.,* 2012). In order to encourage family members to take good care of their own dental health, educational materials should also emphasise the familial component of HGF[7][1]. The possibility of early intervention

and better health outcomes for impacted children can be greatly raised by raising community awareness and educating them about HGF.

REFERENCES

Afonso, R. A., Godinho, G. V., Silva, C. A., Silva, E. J., & Volpato, L. E. (2022). Hereditary gingival fibromatosis and developmental anomalies: A case report. *Cureus, 14*(4), e24219.

Almiñana-Pastor, P. J., Buitrago-Vera, P. J., Alpiste-Illueca, F. M., & Catalá-Pizarro, M. (2017). Hereditary gingival fibromatosis: Characteristics and treatment approach. *Journal of Clinical and Experimental Dentistry, 9*(4), e599–e602.

Cunha, J. L. S., Ramos, M. A. C. D. C., Regis, D. M., Sanchéz-Romero, C., de Andrade, M. E., Bezerra, B. T., & de Albuquerque-Júnior, R. L. C. (2020). Generalized hereditary gingival fibromatosis in a child: Clinical, histopathological and therapeutic aspects. *Autopsy & Case Reports, 10*(1), e2020140.

Dhadse, P., Yeltiwar, R., Pandilwar, P., & Gosavi, S. (2012). Hereditary gingival fibromatosis. *Journal of Indian Society of Periodontology, 16*(4), 606–609.

National Center for Advancing Translational Sciences. (n.d.). *Fibromatosis, gingival, 1*. GARD. Retrieved September 8, 2025, from https://rarediseases.info.nih.gov/diseases/6509/fibromatosis-gingival-1

Seki, K., & Sato, S. (2022). A 15-year follow-up of a gingivectomy procedure for idiopathic gingival fibromatosis: A case report and literature review. *The Journal of Clinical Pediatric Dentistry, 46*(2), 119–124.

Strzelec, K., Dziedzic, A., Łazarz-Bartyzel, K., Grabiec, A. M., Gutmajster, E., Kaczmarzyk, T., Plakwicz, P., & Gawron, K. (2021). Clinics and genetic background of hereditary gingival fibromatosis. *Orphanet Journal of Rare Diseases, 16*(1), 492.

Swaroop, A. K. (2024, August 12). *What is hereditary gingival fibromatosis?* iCliniq. Retrieved September 8, 2025, from https://www.icliniq.com/articles/dental-oral-health/hereditary-gingival-fibromatosis

Wikipedia contributors. (2022, February 19). *Hereditary gingival fibromatosis*. In Wikipedia. Retrieved September 8, 2025, from https://en.wikipedia.org/wiki/Hereditary_gingival_fibromatosis

Wikipedia contributors. (2023, December 3). *Oral manifestations of systemic disease*. In Wikipedia. Retrieved September 8, 2025, from https://en.wikipedia.org/wiki/Oral_manifestations_of_systemic_disease

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