

SURGICAL MANAGEMENT OF GENERALIZED GINGIVAL ENLARGEMENT – A CASE SERIES

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Abstract

Introduction: Generalized gingival enlargement is characterized by massive and exuberant gingival overgrowth that poses social, aesthetic, phonetic and functional problems for the patient. Therefore, it requires meticulous management.

Objective: To describe the surgical management of generalized gingival enlargement by electrosurgical excision of patients presenting to a tertiary care centre.

Study Design: Case series.

Materials and Methods: The study was conducted at the Department of Oral and Maxillofacial Surgery, de'Montmorency College of Dentistry, Lahore, from January 2010 to December 2012. A total of sixteen patients were operated by using electrosurgical approach under general anaesthesia for surgical excision of generalized gingival enlargement.

Results: All of the sixteen patients, 11 males and 5 females, showed excellent healing postoperatively

without any recurrent gingival overgrowth.

Discussion: To the best of our knowledge, the current study presents the largest case series of generalized gingival enlargement. Most of these cases were with massive disease due to lack of information of the study population about their disease, delay in referral by the general dental practitioners, painless and innocent nature of the problem. Early referral of such patients to tertiary care centers can prevent the patients from social and psychological embarrassment.

Conclusion: Electrosurgical excision is an excellent surgical technique for management of generalized gingival enlargement. Moreover, cross comparative studies are required to establish some diagnostic and therapeutic standards for such patients.

Keywords: Generalized gingival enlargement, aggressive periodontitis, electrosurgery, gingival hyperplasia, idiopathic gingival fibromatosis.

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Introduction

Increase in size of the gingiva is a common feature of gingival disease and is termed as gingival enlargement. Generalized gingival enlargement is characterized by massive and exuberant gingival overgrowth that appears to involve and cover the tooth surfaces throughout the mouth.¹ It can be due to various causes. Most prevalent are the inflammatory, idiopathic or hereditary gingival fibromatosis, drug – induced, systemic diseases or conditions e.g. diabetes mellitus, leukemia etc.^{2,3}

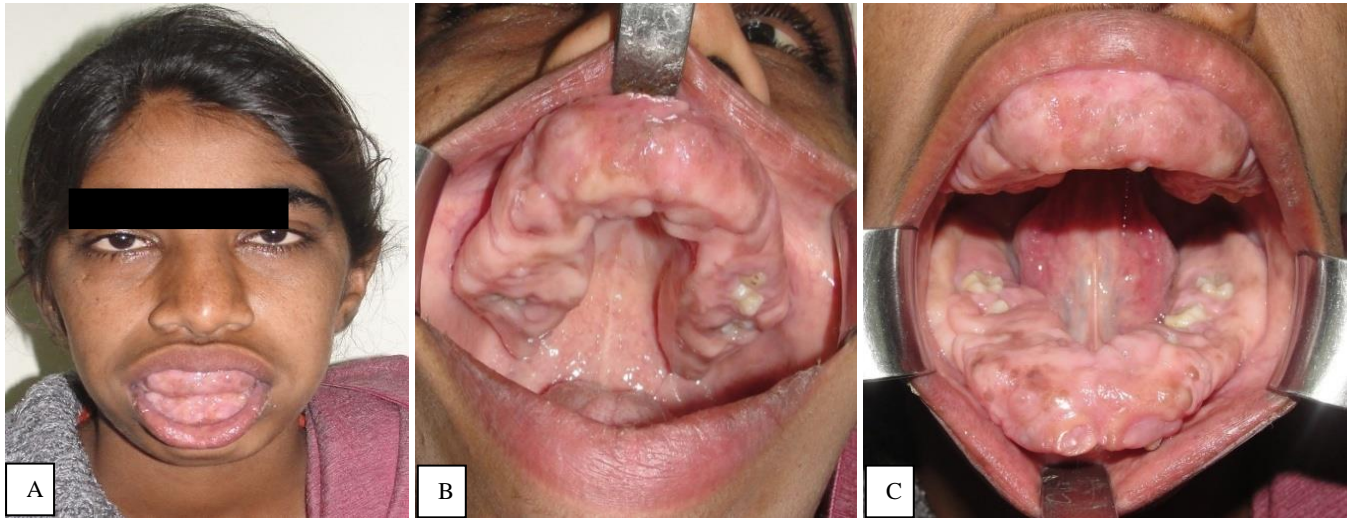


Fig. 1: Hereditary Gingival Enlargement. A - Extra-oral view. B - Upper jaw. C - Lower jaw.

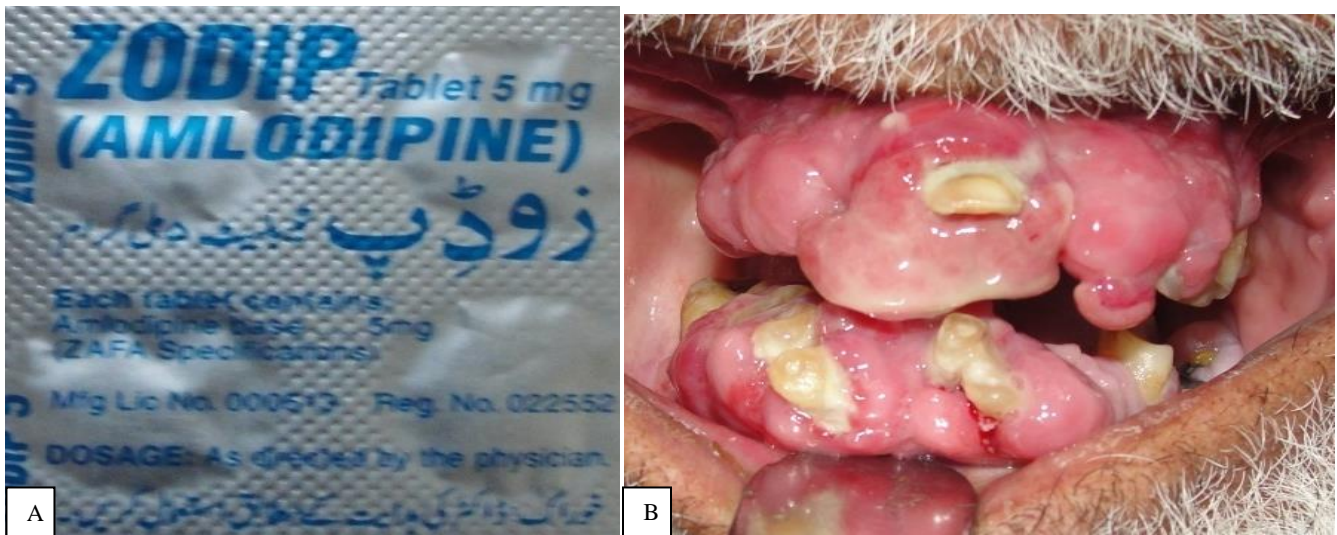


Fig. 2: A-Calcium channel blocker, ZODIP. B-Drug (Amlodipine) induced Gingival Enlargement in a Hypertensive Patient.

Hereditary gingival fibromatosis is a slow growing gingival enlargement with great clinical and genetic heterogeneity. The enlargement affects the attached gingiva, as well as gingival margin and interdental papillae, in contrast to drug – induced overgrowth, which is often limited to gingival margin and interdental papillae.¹ The enlarged gingiva is pink, firm, and leathery in consistency and has a pebbled or stippled surface, with little tendency to bleed.⁴ In severe cases, it leads to overwhelming gingival tissue growth completely covering the teeth and projects into the oral vestibule (Fig. 1).⁵

Generalized gingival enlargement leads to prob-

lems in chewing and mastication and maintaining good oral hygiene. It causes difficulty in speech, social, psychological and aesthetic embarrassment for the patient.⁶ Moreover, it may also cause problems with tooth eruption, over retention of primary teeth, spacing, tilting or rotation of teeth, malocclusion and lip incompetence.^{5,7}

Drug induced gingival enlargement is a well-known consequence of administration of anticonvulsants (phenytoin, vigabatrin, sodium valproate, primidone), immune-suppressants (cyclosporin) and calcium channel blockers (nifedipine, amlodipine, verapamil).^{4,8,9,24,25}

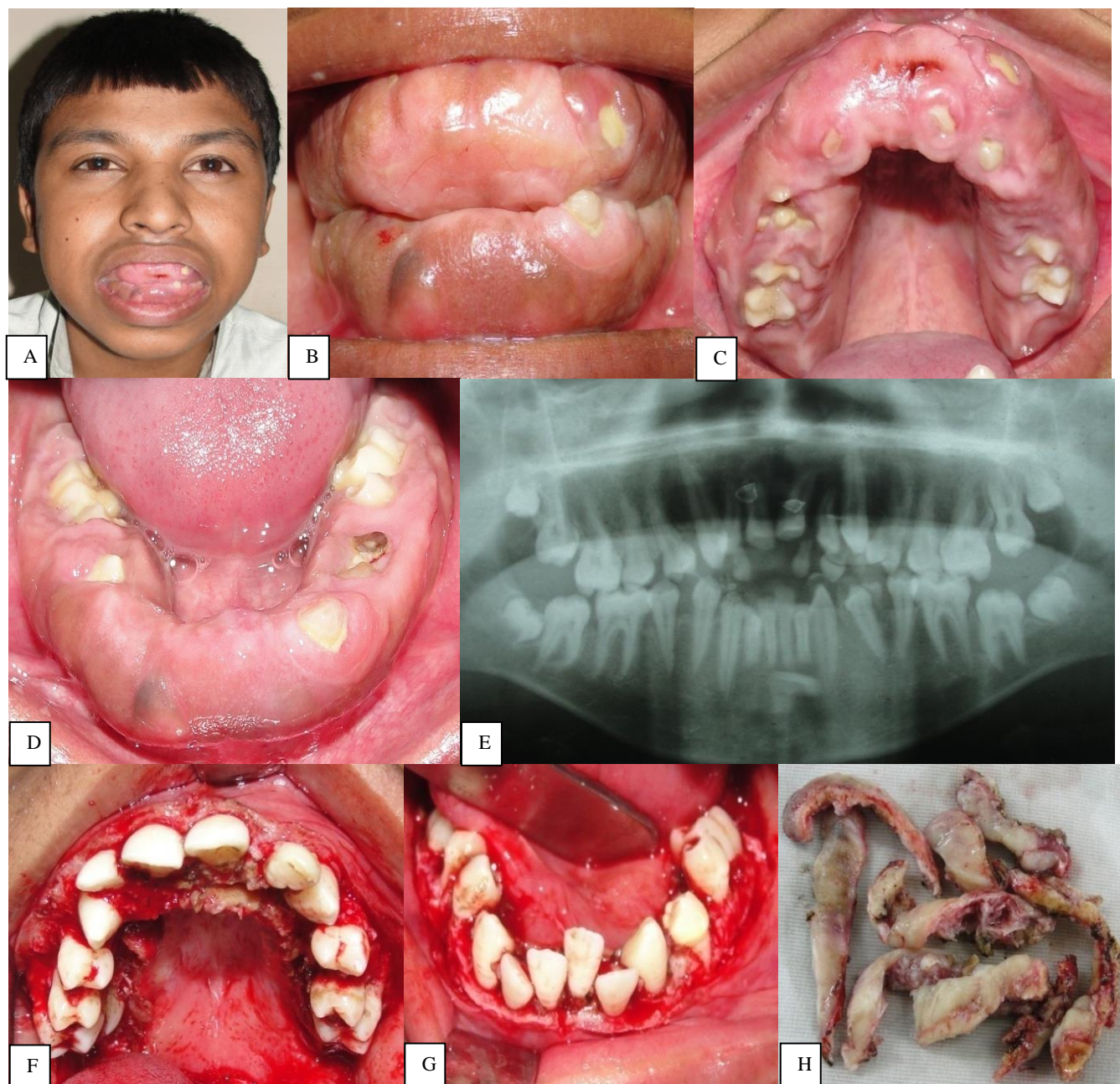


Fig. 3: Idiopathic Gingival Enlargement. A - Extra-oral view. B - Intra-oral view. C - Upper jaw. D - Lower jaw. E - Panoramic view. F and G - Electro-surgical excision of exuberant gingival tissue in upper and lower jaws. H - Excised gingival tissue.

Diagnosis of various forms of gingival enlargements is substantiated by patient's history, clinical evaluation, panoramic radiography and histopathological examination.⁵ The definitive treatment is surgical intervention and good oral hygiene maintenance to improve the compromised esthetics and functions of patient.¹⁰

There are a lot of case reports about generalized gingival enlargement in international literature but only three case series of three to four cases each about such patients. This paper presents the first largest case series of sixteen patients from different areas of Pakistan with severe generalized enlargement of the maxillary and mandibular gingiva. Generalized gingi-

val enlargement poses social, aesthetic, phonetic and functional problems for the patient and therefore, it requires meticulous management. The aims of current study were to present the surgical management of generalized gingival enlargement with electrosurgery. This paper will be useful for the surgeons to select an easily available, economical surgical technique for management of such patients.

Materials and Methods

This case series was conducted at the Department of Oral and Maxillofacial Surgery, de'Montmorency College of Dentistry, Lahore from January 2010 to December 2012. Ethical approval was taken from the ethical committee of de'Montmorency College of Dentistry. The assessment of patients was done by detailed relevant history, systematic clinical and radiographic examination. The status of enlarged gingival tissue was assessed by intra-oral clinical evaluation and panoramic radiograph. In some cases probing was performed with diagnostic and periodontal probes to differentiate between exostosis and gingival enlargement. All patients presenting with chief complaints related to generalized enlarged gingival tissue irrespective of age and gender and ASA I and II (American Society of Anaesthesiologists) were selected for the study. Patients with systemic disorder (e.g. hypertension) leading to gingival enlargement were also included in the study. Patients with any severe systemic diseases and not fit for general anaesthesia were excluded from the study. For each patient, a number of variables were recorded e.g. demographic details (age, gender), site (upper or lower jaw), type (of gingival enlargement) and associated problems.

After explaining the risk benefit ratio and significance of surgery, a written informed consent was taken from all patients. A total of sixteen patients were operated for surgical excision of generalized gingival enlargement. All of these cases were operated by a single experienced consultant under general anaesthesia for excision of exuberant gingival tissue. Surgical excision of all types of gingival enlargement was done with electrosurgery.

Surgical Procedure: Following administration of general anesthesia and intraoral disinfection with 0.12% chlorhexidine gluconate mouth rinses, a periodontal probe was used to outline the incision for gingival enlargement. The incision line was then delineated

with the sharp tip needle electrocautery all the way down to the base of the enlarged gingival tissue, at a level of 45° angle. A light and gentle 'paintbrush-like' stroke was used to guide the electrode while performing the incision. Owing to the bulk of the gingival enlargement, initial shallow cuts were made prior to refining the incision. Taking into consideration the amount of heat generated while using the electrocautery, saline irrigation was done after removal of each bulk of the gingival tissue. Moreover, a 15 seconds cooling period was also advocated between successive incisions or recontouring of the gingiva. All four quadrants of each patient's gingival tissue were excised in the same session. The remnants of soft tissue tags of gingival tissue from interdental areas were removed by using sharp surgical and periodontal curettes (Gracey curettes). Moreover, to prevent recurrence, the minute tissue. The patients were prescribed intravenous antibiotics and analgesics for 3 – 5 days followed by oral medications. Post surgical care was followed by a regular 0.12% chlorhexidine rinses twice daily for 2 weeks. Periodontal dressings were removed after one week in each patient during follow up visits.

The postoperative course was uneventful and the patient's aesthetic concerns were addressed. All the data were collected in a specially designed proforma and entered in Microsoft excel worksheet to analyze and find out distribution of different variables in terms of proportions and percentages. The variables were presented in graphs and charts.

Results

A total of sixteen patients having four different types of generalized gingival enlargements were included in the study. The age range was from 11 to 62 years. Most of the patients were from second decade of life and there was a male predilection in the current study. The age and gender distribution of patients is shown in Fig.4 and Fig. 5 respectively. A strong predilection was noted for generalized gingival enlargement to involve the both jaws. Out of two females having inflammatory gingival enlargement, one female had inflammatory enlargement in upper jaw alone. The relative distribution of patients according to type of generalized gingival enlargement is shown in Fig.6.

Two patients were with hereditary gingival enlargement having positive family history of gingival enlargement. There was a more preponderance of idiopa-

thick or hereditary gingival enlargement in early life and drug induced type was common in older patients.

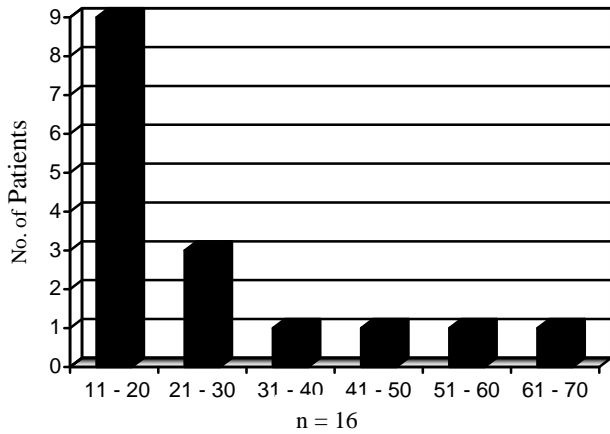


Fig. 4: Age Distribution in Generalized Gingival Enlargement.

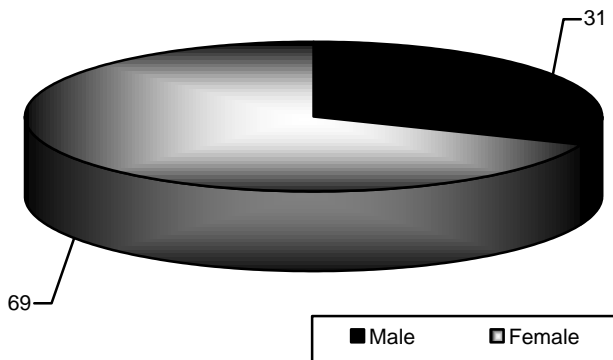


Fig. 5: Gender Distribution of Generalized Gingival Enlargement.

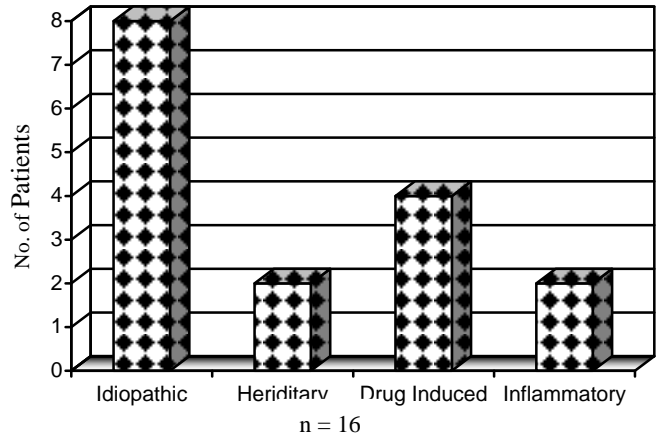


Fig. 6: Distribution of Different Types of Generalized Gingival Enlargement.

Among the four patients with drug induced generalized gingival enlargement, three patients were hypertensive and were on antihypertensive therapy. Out of these three patients, one patient was also diabetic and was on insulin therapy. The remaining one patient was epileptic and was on anticonvulsant drugs. All these patients were managed with closed consultation of their respective physicians with respect to pre-operative, per-operative and post-operative management. For rest of the eight cases there was no apparent cause, family history was negative and hence were diagnosed as idiopathic generalized gingival enlargement. Post-surgical follow-up of more than one year demonstrated no recurrence. In all cases, gingival tissue completely filled the interproximal spaces between the teeth and surrounded the neck of the teeth in a collar like fashion with gingival margin (Fig. 7).

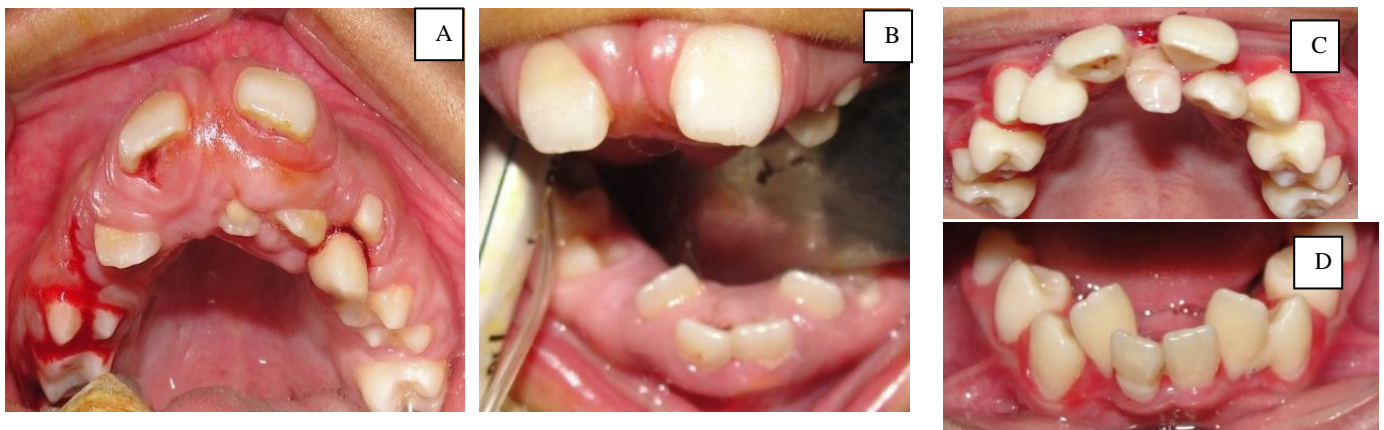


Fig. 7: A & B-Idiopathic Gingival Enlargement in upper and lower jaws of a child with retained deciduous teeth. C & D-Post-operative photograph of upper and lower dentition after 2 weeks of electro-surgical excision.

Discussion

Symptoms associated with generalized gingival enlargement are the common complaints of patients which compel them to present to oral and maxillofacial surgeons for treatment. Oral and Maxillofacial Surgery Department of de'Montmorency College of Dentistry / Punjab Dental Hospital, Lahore is one of the well renowned maxillofacial units in Pakistan and caters the patients from all over the country. Being a tertiary care centre, most of the patients operated are referred from remote areas and are usually presented with massive disease.

The literature search in PubMed revealed mostly the case reports about the gingival enlargement. Only three case series (one containing three cases and two of four cases) have been reported till now and these studies contain both localized and generalized gingival enlargement cases.^{8,11,14} To the best of our knowledge, the current study presents the largest case series of sixteen patients of different types of gingival enlargement. Moreover, this case series is about the cases of generalized gingival enlargement only and not the localized gingival enlargement.

The etiopathogenesis of gingival enlargement is poorly understood but can be attributed to plaque accumulation, puberty, pregnancy, nutritional deficiency, hormonal stimulation, blood dyscrasias or may result from factors like inflammation, drugs and inheritance.^{12,13,18,24,27}

In the current study, most of patients were with idiopathic gingival enlargement followed by drug induced type, hereditary type and inflammatory type. All of these cases were with massive disease. The possible reasons for this could be the lack of information of the study population about their disease, delay in referral by the primary dental health care professionals, painless and benign slow growing nature of the problem.^{14,18,26} Moreover; it takes much time for the gingival enlargement to cause aesthetic and functional problems significant for the patients to seek treatment. There is relatively very low incidence of inflammatory enlargement in the current study. This could be due to the reasons that the patients with inflammatory gingival enlargement are also managed by the general dental practitioners and periodontologists and may not be referred to oral and maxillofacial surgeons in tertiary care centers. Idiopathic and hereditary type of gingival enlargements were common in younger age patients while drug induced type was common in later age groups because the later type occurs in medically compro-

mised patients. Currently more than twenty prescription medications are associated with gingival enlargement.²⁴ One epileptic patient having phenytoin induced gingival enlargement was a teen-ager. Two elderly patients had very compromised and mobile teeth and total dental clearance was done in these cases along with surgical excision of their gingival enlargement. All the young patients having malocclusion were referred for orthodontic treatment after surgical excision of their gingival enlargement during follow up visits.

Idiopathic gingival fibromatosis (IGF) can occur as an isolated disease or as a part of a syndrome.^{15,19} The symmetrical generalized form of idiopathic gingival enlargement is more common. Clinically, it is a slowly progressive benign gingival enlargement of keratinized gingiva. Hereditary gingival fibromatosis is genetically heterogeneous.²⁰ It can occur either as autosomal dominant or recessive form and usually a positive family history is always present.^{16-20,27} The syndromes associated with gingival fibromatosis include Zimmerman – Laband syndrome (GF, hypoplastic distal phalanges, hepatosplenomegaly, epilepsy, hypertrichosis, and mental retardation), Jones syndrome (GF and progressive neural deafness), Klippel – Treunay syndrome (GF, hemihypertrophy, Nevus flammeus, hemangioma, hypertelorism, and macrocephaly), Ramon syndrome (GF, hypertrichosis, mental retardation, epilepsy, rheumatoid arthritis, and diabetes mellitus), Rutherford syndrome (GF, unerupted teeth, corneal dystrophy, and mental retardation), Cross syndrome (GF, nanophthalmos, microcornea, and severe mental retardation), Murray – Puretic Drescher syndrome (Juvenile hyaline fibromas), Cornelia de Lange Syndrome, and Tuberous sclerosis.^{4,18-21,27} In the current study no patient presented with generalized gingival enlargement associated with any syndrome. It has recently been found that there are qualitative and quantitative differences in transforming growth factor beta – isoform (TGF- β) and receptor expression by fibroblasts in gingival overgrowth and this may contribute to the pathogenesis of the disease.²⁰

The gingival enlargement usually begins at the time of eruption of primary or permanent dentition. Such patients usually have delayed eruption of permanent dentition, diastema, malpositioning, crowding, rotations and teeth buried in exuberant gingival growth. This leads to difficulty in chewing, mastication and speech as well as aesthetic and social embarrassment for the patients. The patients often used to chew food with their gums and rarely used to practice oral hygiene measures.²⁰⁻²³

Various procedures available for excision of gingival enlargement include external or internal bevel gingivectomy with gingivoplasty using scalpel, electrosurgery and laser surgery.²⁰ There is no consensus among authors regarding the exact time when surgery should be accomplished. According to several authors, the best time is when all of permanent dentition has erupted, because the risk of recurrence is higher before it. The choice of a treatment protocol depends on type of gingival enlargement, its severity, extent of area requiring surgery, amount of keratinized gingiva and available resources. In all these options, there is an adjunctive need of thorough scaling, polishing and root planning of the all stable teeth, maintenance of meticulous oral hygiene and patient's compliance to prevent recurrence.²¹⁻²⁴

In the current study, surgical excision of all types of generalized gingival enlargement was done with electrosurgery followed by good oral hygiene measures. In all cases of idiopathic and hereditary gingival enlargements the exuberant gingival tissue was very tough and firm and it was very difficult to excise it with the surgical knife especially from the interdental area, retromolar and maxillary tuberosity region. Moreover, gingival tissue is richly vascular and surgical excision with knife leads to bloody and time consuming procedure.²⁷ Drug induced gingival enlargement was not resolved by conservative measures (changing the drugs and improving oral hygiene) in any of the patients.^{25,26} These patients were also treated by electrosurgery because in these cases the gingival tissue used to bleed profusely. Electrosurgery gives excellent vision of deeper gingival tissue by good haemostatic control. Laser surgery (CO₂ Nd: YAG, diode) is also a choice for gingival excision because it leads to sealing of blood vessels during incision to maintain hemostasis and a clear field of view.^{26,27} But it is expensive, technique sensitive and not available in our center. In the current study, electrosurgery was preferred to treat gingival enlargement because it is economical than lasers, the electrode cuts on its sides as well as on its tip and may be bent to meet the clinical need especially in maxillary tuberosity, retromolar and interdental areas, cuts are made with ease when the device is set correctly, hemostasis is immediate and leads to bloodless surgical field, cutting is consistent, the wound is nearly painless after the procedure, soft tissue has minimal trauma and the tip is self – disinfecting.²⁷

Ramer et al. advocated quadrant by quadrant gingivectomy with periodontal pack placement for 1 week, followed by 0.2% chlorhexidine oral rinse twice

a day for 2 weeks after each surgery. In contrast to this; we treated all the patients under general anaesthesia as a single visit procedure.⁴ This has not only benefited the patient in terms of time saving but also total clearance of the disease in single surgical operation by electrosurgery.²⁰ Japatti¹² et al. Devi¹³ et al. Dhadse¹⁵ et al. and Goyal¹⁷ et al. mentioned no recurrence of gingival enlargement on one year follow up which closely matches the results of current study. In certain case reports there is no recurrence after 2 years, 3 years or even up to 14 years.^{17,27} The current study showed more male predilection which is different finding than the literature which suggests no gender predilection.¹³ As for as the upper and lower jaw involvement is concerned, the findings of current study closely match the literature.^{13,16}

There is a great similarity in the text of case reports about generalized gingival enlargement mentioned in the literature. A few case series present in the literature have very small sample size. Although this study may not represent the Pakistani population as a whole, the results are useful for primary dental practitioners, periodontologists and maxillofacial surgeons because the patients studied represent the range of dental patients with a variety of generalized gingival enlargement presenting to a dental hospital.

Conclusion

Electrosurgical excision is an excellent, easily available and economical surgical technique for management of generalized gingival enlargement. A comprehensive medical history and physical systemic evaluation is essential to rule out other systemic abnormalities. Genetic consultation is mandatory for future family planning in case of hereditary gingival enlargement. Education and awareness regarding the special conditions like puberty, pregnancy, medications as well as meticulous oral hygiene measures and early referral to tertiary care centers are essential in order to reduce the occurrence and proper management of gingival enlargement. Moreover, cross comparative studies are required to establish some diagnostic and therapeutic standards for such patients.

References

1. Newman MG, Takei HH, Klokkevold PR, Carranza FA. Carranza's Clinical Periodontology. Gingival enlargement. 10th Ed. Philadelphia: Elsevier Publishers,

- 2006; 741-77.
2. Babu KB, Pavankumar K, Anuradha BR, Arora N. Hereditary gingival fibromatosis – a case report and management using a novel surgical technique. *South Brazil Dent J.* 2011; 8: 453-8.
 3. Tomar N, Vidhi M, Mayur K. Inflammatory Gingival Enlargement-A Case Report. *J Adv Med Dent Scie* 2014; 2: 109-13.
 4. Katz J, Guelmann M, Barak S. Hereditary gingival fibromatosis with distinct dental, skeletal and developmental abnormalities. *Pediatr Dent.* 2002; 24: 253-6.
 5. Pushpanshu K, Kaushik R, Sathawane RS, Athawale RP. Extensive Gingival Enlargement in Siblings. *Sultan Qaboos Univ Med J.* 2012; 12: 517-21.
 6. Kamolmatyakul S, Kietthubthaw S, Anusaksathien O. Long-term management of an idiopathic gingival fibromatosis patient with the primary dentition. *Pediatr Dent.* 2001; 23: 508-13.
 7. Khan U, Mustafa S, Saleem Z, Azam A, Khan ZA. Hereditary Gingival Fibromatosis; Diagnosis and Treatment. *Pakistan Oral and Dent J.* 2012; 32: 226-31.
 8. Buddiga V, Ramagoni NK, Snehalatha, Mahantesh H. Gingival Enlargement – A case series. *Ann Essence Dent.* 2012; 4: 73-6.
 9. Júnior JRV, Santos CO, Coletta RD, Costa DC, Paranaíba LM, Júnior HM. Immunoexpression of $\alpha 2$ -integrin and Hsp47 in hereditary gingival fibromatosis and gingival fibromatosis – associated dental abnormalities. *Med Oral Patol Oral Cir Bucal.* 2013; 18: 45-8.
 10. Nitin T, Vidhi M, Anamika S. Pregnancy Induced Gingival Enlargement-A Case Report. *People J Sci Res.* 2013; 6: 60-62.
 11. Wagaiyu EG, Ng'ang'a RN, Kemoli AM, "Hereditary gingival fibromatosis: report of family case series," *East Afr Med J.* 2009; 86: 491-3.
 12. Japatti S, Bhatsange A, Reddy M, Patil S, Chidambar, Waghmare A. Bimaxillary unilateral gingival fibromatosis with localized aggressive periodontitis (eating the tooth at the same table). *Contemp Clin Dent.* 2013; 4: 366-70.
 13. Devi PK, Kumar GP, Bai YD, Ammaji AD. Ipsilateral idiopathic gingival enlargement and its management using conventional gingivectomy and diode laser: A recurrent case after 15 years. *J Indian Soc Periodontol.* 2013; 17: 387-90.
 14. Peeran SW, Ramalingam K, Peeran SA, Mugrabi MM, Abdulla KA. Hereditary Nonsyndromic Gingival Fibromatosis: Report of Family Case Series. *Case Rep Dent.* 2013; 2013: 1-4.
 15. Dhadse PV, Yeltiwar RK, Pandilwar PK, Gosavi SR. Hereditary Gingival Fibromatosis. *J Indian Soc Periodontol.* 2012; 16: 606-9.
 16. Sharma S, Goyal D, Shah G, Ray A. Familial gingival fibromatosis: A rare case report. *Contemp Clin Dent.* 2012; 3: 63-6. Goyal L, Bey A, Gupta ND, Varshney A. Diagnosis and management of non-syndromic hereditary gingival fibromatosis in a 13 year old girl: Report of a rare case. *Contemp Clin Dent.* 2012; 3: 210-13.
 18. Aneundi RT, Sudha P, Nayak UA, Peter J. Idiopathic gingival fibromatosis: a case report. *Hong Kong Dent J.* 2006; 3: 53-7.
 19. Cholakis AK, Wiltshire WA, Birek C. Treatment and long-term follow-up of a patient with hereditary gingival fibromatosis: A case report. *J Can Dent Assoc.* 2002; 68: 290-294.
 20. Duddu MK, Muppa R, Reddy GSP, Reddy PVN. Non-syndromic gingival fibromatosis in a mild mental retardation child. *Contemp Clin Dent.* 2012; 3: 206-9.
 21. Yadav VS, Chakraborty S, Tewari S, Sharma RK. An unusual case of idiopathic gingival fibromatosis. *Contemp Clin Dent.* 2013; 4: 102-4.
 22. Luvizuto ER, da Silva JB, Campos N, Luvizuto GC, Poi WR, Panzarini SR. Functional aesthetic treatment of patient with phenytoin – induced gingival overgrowth. *J Craniofac Surg.* 2012; 23: 174-6.
 23. Bansal A, Narang S, Sowmya K, Sehgal N. Treatment and two – year follow-up of a patient with hereditary gingival fibromatosis. *J Indian Soc Periodontol.* 2011; 15: 406-9.
 24. Joshipura V. Sodium valproate induced gingival enlargement with pre-existing chronic periodontitis. *J Indian Soc Periodontol.* 2012; 16: 278-81.
 25. Aldemir NM, Begenik H, Emre H, Erdur FM, Soyoral Y. Amlodipine induced gingival hyperplasia in chronic renal failure: a case report. *Afr Health Sci.* 2012; 12: 576-8.
 26. Muralikrishna T, Kalakonda B, Gunupati S, Koppolu P. Laser – Assisted Periodontal Management of Drug-Induced Gingival Overgrowth under General Anesthesia: A Viable Option. *Case Rep Dent.* 2013; 2013: 1-4.
 27. Padmanabhan S, Dwarakanath CD. Severe gingival enlargement associated with aggressive periodontitis. *J Indian Soc Periodontol.* 2013; 17: 115-9.