

Correction of Mandibular Prognathism by Orthognathic Surgery in Patient with Acromegaly

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Abstract

Background: Acromegaly, a condition which is associated with an acquired progressive disfigurement mainly involving the face and extremities, is a clinical syndrome which results from excessive production of growth hormone (GH) most commonly due to adenoma of the pituitary gland. Acromegaly is a rare disease which due to its slow progression, is mostly diagnosed in late adulthood. Bilateral symmetrical prognathic mandible is considered as a diagnostic symptom of acromegaly. Nowadays, orthognathic surgery is done for treatment of this skeletal deformity; however, because of its relapse after surgery, the efficacy of this procedure remains uncertain. **Case report:** In this report we present a 33 years old man who was admitted for correction of Prognathism resulted from acromegaly in Bou-Ali Hospital. Class III skeletal growth form was achieved in his cephalometry analysis. Macroglossia, concave profile with prominent supra orbital ridges, prognathism, large lips and bulbous nose were detected in his physical examination. Orthognathic surgery as well as median glossectomy was performed and after 1 year follow up no recurrence was detected. **Conclusion:** It is assumed that keeping GH in a normal range before the surgery and also evaluation of orthognathic aspect and endocrine status of the patient in the follow ups are effective in preservation of orthognathic surgery outcomes [GMJ. 2013;2(1):32-34]

Keywords: Acromegaly, Mandibular Prognathism, Orthognathic Surgery, Correction

Introduction

Acromegaly is a clinical syndrome which results from excessive production of growth hormone (GH); the most common cause of this condition is adenoma of the pituitary gland. Acromegaly is associated with a progressive acquired body disfigurement mainly affecting the face and extremities.¹ The uncontrolled secretion of growth hormone especially after puberty leads to ex-

cessive growth of mandible and facial bones which is due to the reactivation of growth centers in condyles.² The major clinical manifestations such as broad extremities, thickening of soft tissues and skin, frontal bossing, enlargement of the nose and jaw, thick lips, marked facial lines, widening of maxilla as well as prominent cheek bones, prognathism, tooth separation, and jaw malocclusion can be seen in these patients. The malformations in acromegaly mostly progress slowly and

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can be seen in years. In severe conditions, skeletal disfigurement can also be seen such as dorsal kyphosis and abnormalities in the ribs and the chest cavity leading to the classical "Punchinello" aspect. Moreover, headaches, nocturnal foul odor sweating, and arthralgia may also be seen in some cases.¹ Mandibular prognathism (MP) or skeletal Class III malocclusion is known as a severe maxillofacial deformity; when a bilateral symmetrical MP is detected in a case, acromegaly should be considered as a differential diagnosis.^{3,4} Because of the skeletal relapse of MP after the orthognathic surgery procedure, the effectiveness of this method still remains uncertain.^{5,6} In this study, we aim to introduce a new method which may diminish the relapse of skeletal deformities after orthognathic surgery in a patient suffering from acromegaly.

Case report

In this report we present a 33 years-old man, suffering from acromegaly, who was admitted to oral and maxillofacial surgery ward of Bou-Ali hospital for correction of prognathism. In his past medical history he mentioned that his extremities began to get abnormally enlarged 12 years prior to this admission and trans-sphenoidal hypophysectomy was conducted because of pituitary adenoma

after 3 years. In his first admission, a concave profile with prominent supraorbital ridges, prognathism, large lips and bulbous nose were detected. His GH level was at normal range at the time of admission. Cephalometrical analysis declared Class III skeletal growth form as well as about 14 mm reverse over jet. Macroglossia was also detected in this patient (Figure 1).

Orthognathic surgery was conducted on his mandible and maxilla. Lefort osteotomy operation was done to advance the maxilla for about 8 mm. Bilateral Sagittal Split Ramus Osteotomy (BSSRO) was also conducted for advancement of mandible for about 6 mm. After the surgery, reverse over jet and mandibular excess was corrected, the appearance got better and the lip competence as well as straight profile was achieved lateral cephalometry was also confirmed the correction of the profile and the angles (Figure 2). Six months after orthognathic surgery, glossectomy was conducted. After 1 year follow up, corrected profiles and angles was preserved.

Discussion

Acromegaly is a rare disease occurs in 3-4 cases per million per year.^{4,7} Due to its slow progression, it is mostly diagnosed in late adulthood; It occurs equally in both men

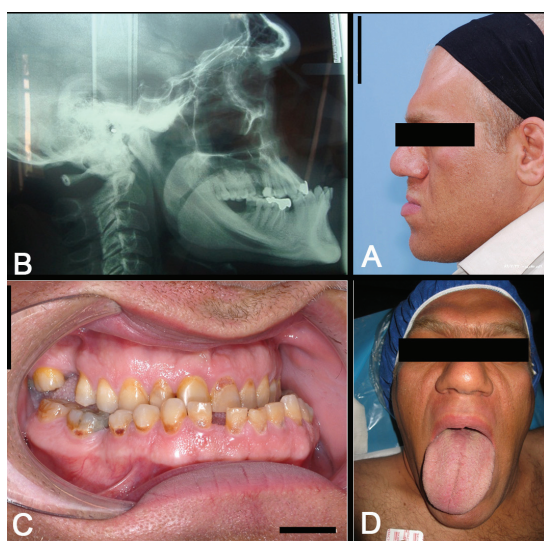


Figure 1. Pre-operation images of mandibular prognathism in a patient with acromegaly. A, C: Lateral and oral views of the defect; B: Prognathism in cephalometry radiography; D: Macroglossia in the patient.



Figure 2. Post-operation images of mandibular prognathism in a patient with acromegaly. A, D: Lateral and frontal views of the corrected defect; B: Corrected prognathism in cephalometry radiography; C: Corrected misalignment in oral view of the patient.

and women.^{8,9} Surgical procedures aiming to correct skeletal deformities and endocrine malfunction are performed in acromegaly.¹⁰ Among them, sphenoidal hypophysectomy is considered as the most effective and the most prevalent procedure.¹¹ The early outcomes of this procedure were convincing in all patients; however, the long term outcomes differ from patient to patient. In a study it was declared that in some patients the acromegaly recurred even after a successful drainage of adenoma.¹² On the contrary, only in one study, it was found that the surgical outcome in acromegaly has no difference from that one in normal patients; Moreover, it was declared that in such patients after endocrine balance, mandibular osteotomy must be conducted in order to achieve facial contour and perfect occlusion.¹³ However, in most cases of acromegaly the risk of recurrence of GH level abnormalities and facial deformities is more than other cases; thus, by sphenoidal hypophysectomy these recurrences may be mild and clinically undetectable.¹⁴ Furthermore, in another study,

sphenoidal hypophysectomy was considered as a preventive procedure which is conducted in order to inhibit unpredictable mandibular growth, while it can also cause the mandibular function loss during the time.¹⁵ In the present case, hypophysectomy was performed twice and the adenoma was totally extracted. The GH level was preserved in normal ranges before the surgery and also one year after the surgery. It is assumed that keeping GH in a normal range before the surgery and also evaluation of orthognathic aspect and endocrine status of the patient in the follow-ups is effective in preservation of orthognathic surgery outcomes.

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References

1. Chanson P, Salenave S. Acromegaly. *Orphanet J Rare Dis.* 2008;3:17.
2. Yagi T, Kawakami M. Surgical orthodontic correction of acromegaly with mandibular prognathism. *Angle Orthodontist.* 2004;74:125-31.
3. Chang HP, Tseng YC, Chang HF. Treatment of mandibular prognathism. *J Formos Med Assoc.* 2006;105(10):781-90.
4. Michiwaki Y, Yoshida H, Ohno K, Michi K. Factors contributing to skeletal relapse after surgical correlation of mandibular prognathism. *Journal of Craniomaxillofac Surgery.* 1990;18(5):195-200.
5. Holdaway IM, Rajasoorya C. Epidemiology of acromegaly. *Pituitary.* 1999;2(1):29-41.
6. Yashiro K, Takada K. Improvements in smoothness of chewing cycles in adults with mandibular prognathism after surgery: a longitudinal study. *J Oral Rehabil.* 2013.
7. Ezzat S, Forster MJ, Berchtold P. Acromegaly Clinical and biochemical features in 500 patients. *Medicine(Baltimore).* 1994;73:233-40.
8. Melmed S. Acromegaly. *The Pituitary Malden, Mas.* 2002:419-54.
9. Merza Z. Modern treatment of acromegaly. *Postgrad Med J.* 2003;79:189-94.
10. Meij BP, Auriemma E, Grinwis G, Buijtel JJ, Kooistra HS. Successful treatment of acromegaly in a diabetic cat with transsphenoidal hypophysectomy. *J Feline Med Surg.* 2010 May;12(5):406-10.
11. Clayton RN. New developments in the management of acromegaly. Should we achieve absolute biochemical cure? *J Endocrinol.* 1997;155(1):23-9.
12. Gondim JA, Schops M. Endoscopic endonasal transsphenoidal surgery: surgical results of 228 pituitary adenomas treated in a pituitary center. *Pituitary.* 2010;13:68-77.
13. Liu JK, Das K, Weiss MH, Laws ER, Couldwell WT. The history and evolution of transsphenoidal surgery. *J Neurosurg.* 2001;95(6):1083-96.
14. Ueki k, Nakagawa K, Matsumoto N, Yamamoto E. An experience of surgical reduction in a case with acromegaly. *Jpn J Jaw Deformities.* 1996;6:170-5.
15. Gosau M, Vogel C, Moralis A, Proff P, Kleinheinz J, Driemel O. Mandibular prognathism caused by acromegaly – a surgical orthodontic case. *Head and Face Medicine.* 2009;5(16):1-5.