

# Orthognathic Surgery is Seen a Secondary Procedure Supporting a more Fundamental Orthodontic Objective

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**Received date:** January 03, 2022, Manuscript No. IPJOE-22-13049; **Editor assigned date:** January 06, 2022, PreQC No. IPJOE-22-13049 (PQ);

**Reviewed date:** January 14, 2022, QC No. IPJOE-22-13049; **Revised date:** January 23, 2022, Manuscript No. IPJOE-22-13049 (R); **Published date:** January 29, 2022, DOI: 10.36648/2469-2980.21.8.51

**Citation:** Prahasanti C (2022) Orthognathic surgery is seen a secondary procedure supporting a more fundamental orthodontic objective. J Orthod Endod Vol. 8 No.1:51.

## Introduction

Orthographic surgery also known as corrective jaw surgery or simply jaw surgery, is surgery designed to correct conditions of the jaw and lower face related to structure, growth, airway issues including sleep apnea, TMJ disorders, malocclusion problems primarily arising from skeletal disharmonies, other orthodontic dental bite problems that cannot be easily treated with braces, as well as the broad range of facial imbalances, disharmonies, asymmetries and malproportions where correction can be considered to improve facial aesthetics and self-esteem. The origins of orthographic surgery belong in oral surgery, and the basic operations related to the surgical removal of impacted or displaced teeth - especially where indicated by orthodontics to enhance dental treatments of malocclusion and dental crowding. Originally coined by Harold Hargis, it was more widely popularised first in Germany and then most famously by Hugo Obwegeser who developed the BSSO operation. This surgery is also used to treat congenital conditions such as cleft palate. Typically surgery is performed *via* the mouth, where jaw bone is cut, moved, modified, and realigned to correct malocclusion or dentofacial deformity. The word osteotomy means the division of bone by means of a surgical cut.

The jaw osteotomy, either to the upper jaw or lower jaw and usually both allows (typically) an oral and maxillofacial surgeon to surgically align an arch of teeth, or the segment of a dental arch with its associated jawbone, relative to other segments of the dental arches. Working with orthodontists, the coordination of dental arches has primarily been directed to create a working occlusion. As such, orthogenetic surgery is seen a secondary procedure supporting a more fundamental orthodontic objective. It is only recently, and especially with the evolution of oral and maxillofacial surgery in establishing itself as a primary medical specialty - as opposed to its long term status as a dental speciality - that orthognathic surgery has increasingly emerged as a primary treatment for obstructive sleep apnoea, as well as for primary facial proportionality or symmetry correction. The primary use of surgery to correct jaw disproportion or malocclusion is rare in most countries due to private health insurance and public hospital funding and health access issues. A small number of mostly heavily socialist funded countries report

that jaw correction procedures occur in some form or other in about 5% of a general population, but this figure would be at the extreme end of service presenting with dentofacial deformities like maxillary prognathisms, mandibular prognathisms, open bites, difficulty chewing, difficulty swallowing, temporomandibular joint dysfunction pains, excessive wear of the teeth, and receding chins. Increasingly, as people are more able to self-fund surgery, 3D facial diagnostic and design systems have emerged, as well as new operations that enable for a broad range of jaw correction procedures that have become readily accessible; in particularly in private maxillofacial surgical practice. These procedures include IMDO, SARME, Genio Pully, custom BIMAX, and custom PEEK procedures. These procedures are replacing the traditional role of certain orthognathic surgery operations that have for decades served wholly and primarily orthodontic or dental purposes.

## Cleft lip and palate

Orthognathic surgery is a well-established and widely used treatment option for insufficient growth of the maxilla in patients with an orofacial cleft. There is some debate regarding the timing of orthognathic procedures, to maximise the potential for natural growth of the facial skeleton. Patient reported aesthetic outcomes of orthognathic surgery for cleft lip and palate appear to be of overall satisfaction, despite complications that may arise. A potentially significant long-term outcome of orthognathic surgery is impaired maxillary growth, due to scar tissue formation. A 2013 systematic review comparing traditional orthognathic surgery with maxillary distraction osteogenesis found that the evidence was of low quality; it appeared that both procedures might be effective, but suggested distraction osteogenesis might reduce the incidence of long-term relapse. The most common causes of cleft lip and palate are genetic and environmental factors. Clefts are known to occur due to folic acid deficiency, iron and iodine deficiency.

## Sagittal split osteotomy

This procedure is used to correct mandible retrusion and mandibular prognathism (over and under bite). First, a

horizontal cut is made on the inner side of the ramus mandibulae, extending anterally to the anterior portion of the ascending ramus. The cut is then made inferiorly on the ascending ramus to the descending ramus, extending to the lateral border of the mandible in the area between the first and second molar. At this time, a vertical cut is made extending inferior to the body of the mandible, to the inferior border of the mandible. All cuts are made into the middle of the bone,

where bone marrow is present. Then, a chisel is inserted into the preexisting cuts and tapped gently in all areas to split the mandible of the left and right side. From here, the mandible can be moved either forwards or backwards. If sliding backwards, the distal segment must be trimmed to provide room in order to slide the mandible backwards. Lastly, the jaw is stabilized using stabilizing screws that are inserted extra-orally. The jaw is then wired shut for approximately 4–5 weeks.