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BRACE PLACE Orthodontic Update

# *Surgical—Orthodontic Treatment: Who, When and How?*

With carefully coordinated orthodontics and surgery, we can now correct severe dental and facial deformities that were previously almost untreatable. This treatment can be of tremendous benefit to patients and an important step in solving complex dental problems at almost any age.

## WHO is a Candidate for Surgical-Orthodontic Treatment?

Obviously, surgery is reserved for the most severe orthodontic problems. These fall into three major groups: 1). Congenital deformities such as hemifacial microsomias, clefts etc., 2). Jaws and teeth displaced by facial fractures and 3). Major distortions of facial growth. The third group, by far the largest, is the focus of this newsletter.

**Types of problems.**

Most children with Class II or Class III malocclusion have too much or too little growth of one or both jaws. So do many children with anterior open bite. Those three malocclusion types comprise the great majority of patients who need surgical-orthodontic treatment.

The best estimate is that 95% of skeletal Class II problems can be corrected with orthodontics alone, leaving only the worst, 5 %, as candidates for surgery. When Class II surgery is needed, 2/3 of the patients need only their lower jaw lengthened, but 1/3 need their maxilla repositioned, usually up more rather than forward. It's true that deficient mandibular growth is the major contributor to skeletal Class II problems, but excessive maxillary growth occurs frequently.

Both growth modification and camouflage by moving teeth are less effective in Class III cases than Class II cases. Even so, 2/3 to 3/4 of skeletal Class III population can be managed with orthodontics alone, leaving the worst, 25-33%, for eventual jaw surgery. Skeletal open bite, which really is a long face deformity, falls somewhere in between Class II and Class III. The great majority of young children with open bite have no skeletal problem, just a disturbance in tooth eruption from sucking habits. When the sucking habit stops, the open bite usually disappears. The longer an open bite persists, the more likely it's due to a growth problem. By adolescence, excessive face height is very difficult to control, and when the face becomes abnormally long, surgery is almost the only way to correct it.

There are more Class II than Class III or long face patients in the American population. That's why surgical Class II correction is the major kind of surgical-orthodontic treatment, even though such a small percentage need surgery.

**Limits of Orthodontics, Indications for Surgery**.

It's difficult to be quantitative about limits of orthodontics alone, and therefore, the indication for surgery, for 2 reasons: 1). Orthodontics alone can do a lot more for a growing child than a non-growing adult, so some problems that could be treated orthodontically in a child may require surgery in an adult, and 2). Facial esthetics must be considered in making the decision. If you get the teeth to meet but leave the patient looking deformed (by retracting protruding incisors all the way back to a weak chin, for instance), you probably haven't helped that individual and may have done harm. The goal of treatment, orthodontic or surgical, is to give the patient acceptable dental occlusion and acceptable facial esthetics.

Despite that, some numbers are worth keeping in mind. A reverse overjet >5mm in a child suggests the likelihood of surgery later. Prior to puberty, large overjet reduction is possible with orthodontic treatment, but after the adolescent growth spurt, >10mm overjet suggests that surgery may be needed, especially if the face is long. In the presence if increased face height, more than 4-5mm lip separation at rest also indicates a probable need for surgery.

**Fig 1: Pre– orthodontic and surgical photos.**

## WHEN Do You Do Surgical-Orthodontic Treatment?

Prior to adolescence, surgery is almost exclusively for children who have congenital deformities or problems related to trauma. For children with severe growth distortions, guiding growth is better than surgery, if it is possible. So surgical orthodontics rarely is indicated before the adolescent growth spurt ends.

**Fig 2: Post Orthodontic and surgery photos.**

**Timing of treatment in adolescents.**

Ideally is it best to wait for surgery until adolescent growth has ceased. Excessive growth, particularly of the mandible, it is necessary to wait until the jaw finally stops growing. It would be nice if surgery stopped the jaw from growing any more, but it doesn't. Therefore, doing surgery too early would possibly require a second surgery after growth has finished.

What about surgical orthodontics in older patients? Can you do it at age 40 or 50? The answer is yes, and in fact this is the fastest growing segment of the patient population. Why would a patient in that age range want surgical correction? Often a patient will live with a severe malocclusion until he or she faces losing teeth with limited prospects for replacement. Correcting a severe malocclusion often is a key to successful rehabilitation in older patients who have begun to lose teeth, and surgical orthodontics may be the only way.

## HOW Do You Coordinate Surgical and Orthodontic Treatment?

The first step in surgical-orthodontic treatment is to get the patient's mouth healthy. This includes restorations, treatment of periodontal disease and control of any potential mucogingival problems.

At least some pre-surgical orthodontic treatment almost always is necessary. The goal of presurgical orthodontics is to position the teeth of each arch relative to their supporting bone ( which may make the malocclusion temporarily worse.) Then the rigid and tightly-fitting arch wires that are an important part of stabilization at surgery are placed and the final presurgical planning is done.

Computer-assisted prediction is a key tool . By combining data from cephalometric radiographs and digital photographs of the patient's face and bite, it is possible to simulate various combinations of jaw and tooth movements.

The surgery itself requires hospitalization, but many only require a day-op procedure ( no overnight stay is required). This is usually with one jaw surgeries. A two jaw surgery may need one to two day hospital stays. Rigid fixation with small titanium bone plates and screws now is almost routine. This allows jaw motion during healing, making the patient more comfortable and often improving stability. Usually, patients now return to the orthodontist for post-surgical finishing in 2-4 weeks.

Post-surgical orthodontics is a critical part of treatment. After surgery, the jaws are correctly aligned, and typically the teeth almost, but not exactly, fit. At this stage, the heavy wires are replaced with light wires that allow tooth movement, and the teeth are guided into their final positions. Usually the braces are removed 6 to 9 months after surgery. Other treatment, including final restorations, can begin immediately after the orthodontics is completed.

The National Institute of Dental Research has given data that there is more than a 90% success rate for surgical-orthodontic cases. The biggest problem at present with this is financial. Until recently, medical insurance covered the surgery and hospitalization. Today, however, most of these types of cases are denied by medical insurances as a cost–reducing measure.

This is frustrating for both doctors and patients. There is an increased trend toward outpatient surgery, since this reduces the surgical costs. Today if a patient is in need for surgical-orthodontics, a determined patient and doctors ( orthodontist and oral surgeon) need to battle the insurance company for surgery to be covered.

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2. Sarver DM. Esthetics in Orthodontics and Orthognathic Surgery. St. Louis, Mosby-Yearbook, 1997.

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# QUIZ

1. T F There is a 100% success rate with surgical orthodontic cases.
2. T F Hemifacial microsomia is a deformity that can benefit from surgery.
3. T F The goal of surgical orthodontics is to give the patient acceptable facial esthetics only.
4. T F Surgical orthodontics cannot be done in anyone over the age of 40.
5. T F The first step in surgical orthodontics is to get the patient's mouth healthy.