

## Systematic Review Orthognathic Surgery

# Minimally invasive orthognathic surgery: a systematic review

N. AlAsseri<sup>1,2</sup>, G. Swennen<sup>1</sup>

<sup>1</sup>Division of Maxillofacial Surgery, Department of Surgery, General Hospital St-Jan Bruges, Bruges, Belgium; <sup>2</sup>Department of Maxillofacial Surgery, Prince Sultan Military Medical City, Riyadh, Saudi Arabia

*N. AlAsseri, G. Swennen: Minimally invasive orthognathic surgery: a systematic review. Int. J. Oral Maxillofac. Surg.* 2018; xxx: xxx–xxx. © 2018 International Association of Oral and Maxillofacial Surgeons. Published by Elsevier Ltd. All rights reserved.

**Abstract.** Minimally invasive techniques are currently applied in many oral and maxillofacial surgical procedures, including orthognathic surgery. A systematic review on the application of potentially minimally invasive procedures in orthognathic surgery was performed to provide a clear overview of the relevant published data. Articles in English on minimally invasive orthognathic procedures, published in the scientific literature, were obtained from the PubMed, Embase, and Cochrane Library databases, and an additional manual search (revised 31 December 2016). After screening the abstracts and applying the eligibility criteria, 403 articles were identified. All articles reporting the potential for minimally invasive orthognathic surgery were included ( $n = 44$ ). The full papers were evaluated in detail and categorized as articles on a minimally invasive surgical approach ( $n = 4$ ), endoscopically assisted orthognathic procedures ( $n = 17$ ), or the use of a piezoelectric device in orthognathic surgery ( $n = 25$ ); two articles were each included in two categories. Although a small incision and minimal dissection is the basic principle of a minimally invasive technique, most articles (90.9%) reported the endoscope and piezoelectric instrument as important tools in minimally invasive orthognathic surgery. Evidence from available studies suggests that patients undergoing minimally invasive orthognathic surgery have less morbidity and make a faster recovery. Further research should aim to obtain higher levels of evidence.

**Key words:** corrective jaw surgery; endoscopically assisted orthognathic procedures; minimally invasive surgery; orthognathic; orthognathic surgery; piezoelectric osteotomy; Piezosurgery; Piezotome.

Accepted for publication 18 April 2018

The correction of dentofacial deformities has evolved substantially since the 1800s when Hüllihen and Von Langenbeck performed the first osteotomies on the jaw. The number of patients opting for orthognathic surgery to correct deformities has continued to grow, although a proportion of patients refuse surgery and request camouflage orthodontic treatment<sup>1–3</sup>. The fear of ‘going under the scalpel’ has always deterred some patients from

surgery, but the concept of ‘minimally invasive surgery’ (MIS) is changing this belief.

The contemporary literature has reported MIS in various medical specialties for a considerable time<sup>4–12</sup>. There is no clear definition of MIS that can be related to preoperative planning, intraoperative techniques and instruments, and postoperative care. Hunter described it as a discipline that involves procedures

performed in a novel way to diminish the sequelae of standard surgical care<sup>13</sup>. MIS was introduced to orthognathic surgery primarily to fulfil the goals of aesthetics, function, and stability. Modification of the ‘wide-open’ conventional approach towards short incisions and minimal dissection enables the surgeon to perform procedures in a gentler manner, to reduce complications, and facilitate a faster recovery.

Recent additions to the surgical armamentarium offer surgeons the option of performing a less invasive procedure. Among these, the endoscopic approach has become the standard of care in many surgical specialties. The evidence-based literature supports this approach as an important tool of MIS, because of the advantages of smaller incisions and reduced reflection with magnified visualization<sup>14</sup>. Ultrasonic or piezoelectric devices (piezoelectric osteotomes, e.g. Piezotome) are another useful tool with proven efficacy in bone cutting. They offer soft tissue preservation, higher precision and control, and the ability to provide a dry operation field because of the cavitation effect and micromovement<sup>15,16</sup>.

There is much debate in the literature over the longer duration and complexity of the MIS technique and the steep learning curve required. Hence, the aim of this systematic review was to evaluate and reach a consensus on the applicability of minimally invasive techniques in the current practice of orthognathic surgery.

## Materials and methods

A systematic search was conducted in the English-language scientific literature for studies on potential minimally invasive techniques in orthognathic surgery published between 1 January 1990 and 30 November 2016. The PubMed (National Library of Medicine, National Center for Biotechnology Information (NCBI)), Embase, and Cochrane Library databases were used, and an additional manual search was performed (revised 31 Decem-

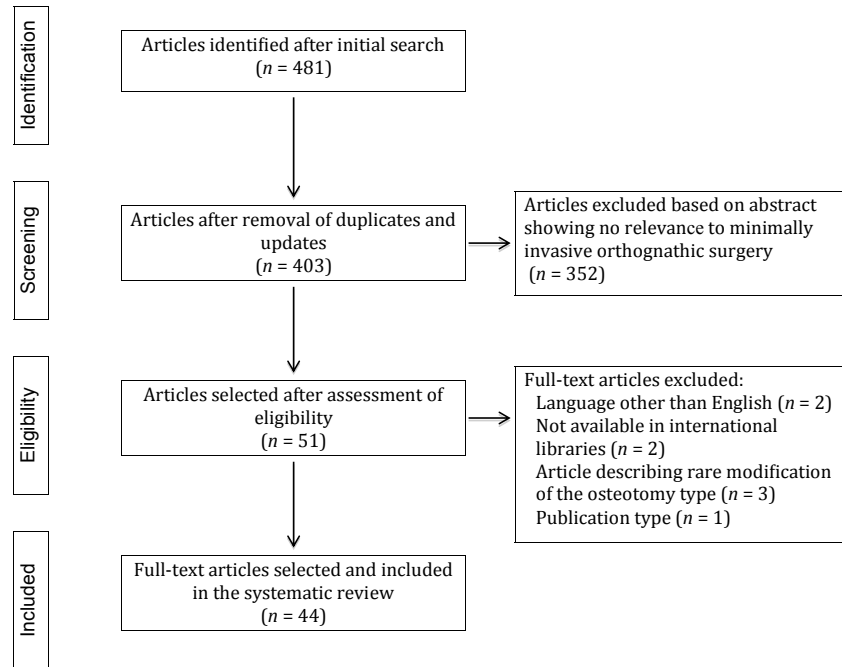


Fig. 1. Methodology of the search and selection process using PubMed, Embase, and the Cochrane Library. (Note: one article was excluded for two reasons.)

ber 2016). The limiting year of 1990 was chosen because the concept of MIS had not been established in the scientific literature prior to that year. The key words used in the search consisted of all possible combinations of 12 primary key words related to MIS; and 18 secondary key words to restrict the search to MIS in orthognathic surgery (Table 1). The methodology of the search and selection process for this systematic review (using the Preferred Reporting Items for Systematic

Reviews and Meta-Analyses (PRISMA) guidelines) is illustrated in Fig. 1.

The initial search revealed 481 articles published between 1990 and 2016. The removal of duplicate references yielded 403 articles. After an extensive reading of the topics of interest in the field of minimally invasive orthognathic surgery, the final inclusion criteria encompassed any report of a minimally invasive approach (i.e., small incision and less reflection) or any article that assessed the use of an endoscope or piezoelectric device in orthognathic surgery, either separately or in combination.

The titles and abstracts of the 403 selected studies were read and evaluated by one author (N.A.), and then reviewed and discussed with the other author (G.S). In the event of a disagreement, the final decision was based on discussion to consensus. The full texts of the selected articles were read after applying the inclusion and exclusion criteria (Table 2). References that contributed to the purpose of the study were retrieved. One hundred and nine articles were related to MIS in other fields outside the scope of this review, such as temporomandibular joint endoscopy, salivary gland endoscopy, piezoelectric surgery in dentoalveolar surgery, and dental implantology. These studies were not included in this review. Two hundred and forty-three papers were excluded because they were not relevant to the topic. Two papers were excluded because they

Table 1. Primary and secondary key words used as search terms in the systematic review on minimally invasive orthognathic surgery.

Primary key word	Secondary key word
Minimally invasive	Orthognathic
Less invasive	Orthognathic surgery
Non-invasive	Corrective jaw surgery
Less aggressive	Maxillary osteotomy
Less traumatic	Mandibular osteotomy
Conservative	Le Fort I osteotomy
Endoscope	Bilateral sagittal split osteotomy
Ultrasonic	Sagittal split osteotomy
Piezotome	Sagittal split ramus osteotomy
Piezoelectric	Vertical subisigmoid osteotomy
Piezosurgery	BSSO
Piezo-osteotomy	SSO
	SSRO
	BSSRO
	IVRO
	EVRO
	Genioplasty
	Chin osteotomy

BSSO, bilateral sagittal split osteotomy; BSSRO, bilateral sagittal split ramus osteotomy; EVRO, endoscopic vertical ramus osteotomy; IVRO, intraoral vertical ramus osteotomy; SSO, sagittal split osteotomy; SSRO, sagittal split ramus osteotomy.

Download English Version:

<https://daneshyari.com/en/article/8963559>

Download Persian Version:

<https://daneshyari.com/article/8963559>

[Daneshyari.com](https://daneshyari.com)