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Dental Surgery

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Temporomandibular Joint Arthroscopy/Arthrotomy

Surgical Considerations

Description: Temporomandibular joint (TMJ) surgical procedures include both open and closed surgical techniques.

TMJ arthrotomy involves a preauricular, postauricular, or endaural incision to gain access to the joint compartment. It usually is performed for severe fibrous adhesion removal in the TMJ, bony or fibrous ankylosis, tumor resection, chronic dislocation, painful nonreducing disc dislocation, and severe osteoarthritis. **Open TMJ** surgery may range from discoplasty; discectomy; arthroplasty; and/or eminoplasty (reshaping of articular eminentia) to optimize the fit of the disc, condyle, and fossa; to total joint replacement utilizing costochondral grafts or vitallium metal implants. For the open treatment of condylar fractures, extraoral approaches (e.g., preauricular, retromandibular, and submandibular) are used. All extraoral approaches to the TMJ have the risks of facial nerve damage and the creation of visible scars. Due to those possible complications, endoscopically assisted transoral approaches for open reduction and miniplate fixation of condylar mandible fractures are used increasingly more often.

TMJ arthroscopy is a minimally invasive technique that has reduced the need for open surgery of the TMJ. Arthroscopic TMJ surgery is indicated for treatment of internal derangements and intracapsular disorders. The major advantage is that it results in less periarticular tissue disruption and better preservation of vascular supply and lymphatic drainage of the joint. The procedure involves insertion of a TMJ miniscope through a preauricular puncture on the canthus-tragus line and insertion of an outflow needle. The joint compartment is continually lavaged with LR. A second cannula can be inserted. Arthroscopic procedures are performed using a triangulation technique. Arthroscopic TMJ procedures include lysis of adhesions and lavage, partial synovectomy, and abrasion arthroplasty. Sometimes a holmium: YAG laser is used to make intraarticular incisions anterior to displaced discs and to treat inflamed synovial tissue. Usually, at the end of the procedure, 2 mg dexamethasone is injected into the joint space. Injection of 2 mL 0.5% bupivacaine mixed with 1 mL sterile saline solution has been shown to significantly reduce postop pain. Arrhythmia, reflex bradycardia, and pulmonary edema have been reported as general complications in TMJ arthroscopy.

Usual preop diagnosis: Internal derangement, subluxation, and ankylosis of TMJ

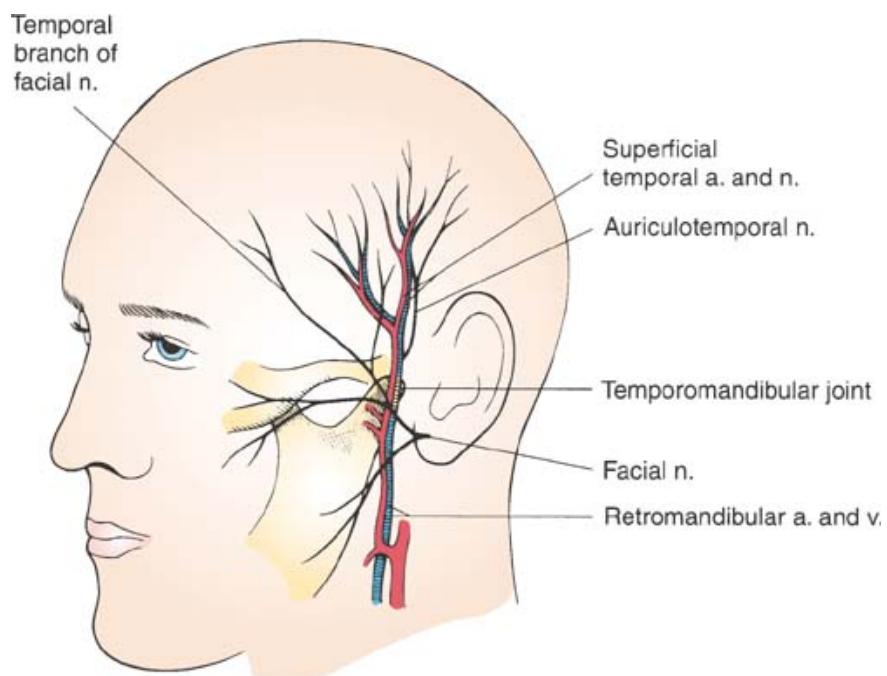


Figure 4-1. Anatomy for TMJ procedure.

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Summary of Procedures

	Arthroscopy	Arthrotomy
Position	Supine	
Incision	Preauricular	
Special instrumentation	Arthroscope; laser	Power tools, endoscope, implant plates
Antibiotics	Cefazolin 1 g	
Surgical time	0.5 h	1.5–3.5 h/side
EBL	Minimal	Minimal-moderate
Postop care	Outpatient procedure	24 h stay
Mortality	Minimal	
	VII nerve damage	
	V nerve damage	
Morbidity	Hemorrhage	
	Partial hearing loss	
	Ear fullness	
	Vertigo	
Pain score	5	5

Patient Population Characteristics

Age range	20–40 yr
Male:Female	1:9
Incidence	20% of adult population suffers from TMJ dysfunction (TMJD)
Etiology	TMJD possibly 2° muscle spasm, bruxism, osteoarthritis; idiopathic; trauma
Associated conditions	Psychiatric problems (typically depression); trismus; pain on opening mouth; stress

Anesthetic Considerations

See [Anesthetic Considerations for Dental/Oral Surgery, p. 264](#).

Suggested Readings

1. Al-Ani Z, Gray R. TMD current concepts: 1. An update. *Dent Update*. 2007; 34(5):278–80, 282–4, 287–8.
2. Friction JR, Look JO, Schiffman E, et al: Long-term study of temporomandibular joint surgery with alloplastic implants compared with nonimplant surgery and nonsurgical rehabilitation for painful temporomandibular joint disc displacement. *J Oral Maxillofac Surg* 2002; 60(12):1400–11.
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5. Laskin DM: Temporomandibular disorders: the past, present and future. *Odontology* 2007; 95(1):10–5.
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7. Schon R, Schramm A, Gellrich NC, et al: Follow-up of condylar fractures of the mandible in 8 patients at 18 months after transoral endoscopic-assisted open treatment. *J Oral Maxillofac Surg* 2003; 61(1):49–54.
8. Tsuyama M, Kondoh T, Seto K, et al: Complications of temporomandibular joint arthroscopy: a retrospective analysis of 301 lysis and lavage procedures performed using the triangulation technique. *J Oral Maxillofac Surg* 2000; 58(5):500–5.

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Oral Surgery

Surgical Considerations

Description: The most common surgeries of the oral cavity are third-molar removal, surgical extractions, apicoectomies, orthodontic exposures of teeth, osseointegrated implants, bone grafting, treatment of oral pathologic conditions, and preprosthetic surgery. **Surgical extractions** of teeth involve intraoperative exposure of the roots through a mucosal incision and removal of overlying bone with a surgical drill. Risks associated with removal of teeth in the mandible are damage to the inferior alveolar nerve (anesthetic numb lip), lingual nerve (anesthetic numb tongue), and, rarely, mandibular fracture. In the posterior maxilla, oroantral fistulas can occur and are closed with a mucoperiosteal flap. **Exposure of teeth** for orthodontic therapy involves creation of a mucoperiosteal flap and attachment of a bracket with a small gold chain, on which the orthodontist can pull to integrate the tooth into the dental arch. **Bone grafting** to the maxilla and mandible is done for augmentation of the atrophied alveolar ridge and the maxillary sinus and in cases of cleft lip and palate. A second team usually harvests the bone at the same time. Possible extraoperative harvesting sites include the anterior or posterior iliac crest, the tibia, and the skull. **Preprosthetic surgery** of the oral soft tissue in preparation for dentures has been replaced largely by insertion of **osseointegrated implants** for retention of individual teeth and dentures. Surgical treatment of **oral pathology** can range from removal of dentigerous cysts, with and without bone graft, to laser or surgical removal of mucosal lesions.

Summary of Procedures

	Dental Surgery	Dental Implants	Oral Pathology	Bone Grafting
Position	Supine			Supine or prone
Incision	Intraoral			Intraoral and donor site
Special instrumentation	Surgical drill	Implant drill and kit	Surgical drill, laser	–
Antibiotics	None	Penicillin 1 g	Cefazolin 1 g	
Unique considerations	Nasotracheal intubation Throat pack			
Surgical time	0.5 h/tooth	0.5 h/implant	1–3 h	2–3 h
EBL	Minimal			Moderate
Postop care	Outpatient		or 24 h stay	24 h stay
Mortality	Minimal			
Morbidity	V nerve damage Aspiration of dental debris			Hemorrhage
Pain score	3	2	3–5	5

Patient Population Characteristics

Age range	12–40 yr	> 16 yr	All ages	> 8 yr
Male:Female	1:1			
Etiology	Idiopathic	Tooth loss	Various	
Associated conditions	Craniofacial syndromes			

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■ Anesthetic Considerations

See [Anesthetic Considerations for Dental/Oral Surgery, p. 264.](#)

Suggested Readings

1. Bataineh AB: Sensory nerve impairment following mandibular third molar surgery. *J Oral Maxillofac Surg* 2001; 59(9):1012–7.
2. Bilkay U, Tokat C, Ozek C, et al: Cancellous bone grafting in alveolar cleft repair: new experience. *J Craniofac Surg* 2002; 13(5):658–63.
3. Coulthard P, Esposito M, Worthington HV, et al: Interventions for replacing missing teeth: preprosthetic surgery versus dental implants (Cochrane Review). *Cochrane Database Syst Rev* 2002; (4):CD003604.
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Restorative Dentistry

■ Surgical Considerations

Description: Multiple dental restorative procedures are performed under GA when there is rampant caries, and an extensive amount of dental work must be performed at one time. The second most common indication for GA is for procedures that need to be performed on mentally retarded patients who are not candidates for a local anesthetic. The actual amount of restorative dentistry is quite variable, depending on the individual case; thus, surgical time can be quite variable. Generally, blood loss is not a problem.

Summary of Procedures

Position	Supine
Incision	Intraoral
Special instrumentation	Dental armamentarium
Unique considerations	Nasal intubation; throat pack
Antibiotics	Penicillin ×5 d po
Surgical time	0.5–3 h
EBL	Minimal
Postop care	PACU → home
Mortality	Minimal

Morbidity

Pain score

Pain
Aspiration of dental debris
Swelling
1–3

Patient Population Characteristics

Age range	2 yr–adult
Male:Female	1:1
Incidence	Unknown
Etiology	Idiopathic or congenital anomalies
Associated conditions	Mental retardation (majority); Down syndrome, seizures

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■ Anesthetic Considerations for Dental/Oral Surgery

■ Preoperative

Most patients presenting for dental or oral surgery usually will require only local anesthesia provided by the dentist/oral surgeon. Deep sedation or GA may be required, however, for several unique patient groups: (1) young children (some with systemic diseases such as CHD, hemophilia); (2) the mentally retarded; (3) those with poorly controlled seizure disorders; (4) those presenting for TMJ procedures; and (5) those with an oral septic focus, who may be quite ill. If the patient does not fall into one of these readily identifiable categories, the reasons for GA should be ascertained. An LMA with a flexible wire-reinforced airway tube (LMA-Flexible) has been used successfully for a variety of oral surgical procedures. The use of an LMA should be discussed with the surgeon in advance since its presence may interfere with the planned procedure.

Airway

Patients presenting for TMJ procedures may have problems with mouth opening (2° pain, trismus, and arthritis), making airway examination difficult. Mouth opening may not improve with GA and muscle relaxation. Nasotracheal intubation using FOL (done awake in patients with difficult airways) should be planned. Examine nares for patency; check for loose teeth.

Respiratory

Surgery should be postponed (at least 2 wk) in patients presenting with Sx of acute RTI (fever, coughing, purulent sputum, etc.). Sx of chronic respiratory disease should be sought and treated before surgery. LMA use has been reported to decrease respiratory complications in children with upper RTIs.

Cardiovascular

Tests: As indicated from H&P

Patients with dysrhythmias may be sensitive to the epinephrine used in local anesthetic solutions administered intraop. As with other types of elective surgery, preexisting cardiovascular problems should be treated before surgery. Prophylactic antibiotics for endocarditis are not required in most patients, exceptions include patients with prosthetic valves, congenital heart disease, h/o infective endocarditis, or heart transplant.

Neurological

Tests: As indicated from H&P

Patients with seizure disorders should be on optimal medical therapy before surgery. Discuss precipitating factors and prodromal Sx with the patient.

Tests: therapeutic levels of anticonvulsant (e.g., phenytoin = 10–20 mcg/mL; carbamazepine = 3–12 mcg/mL; phenobarbital = 10–40 mcg/mL)

Musculoskeletal

In addition to TMJ problems, rheumatoid arthritis is associated with cricoarytenoid joint immobility and cervical spine immobility/instability that may complicate intubation.

Laboratory

Other tests as indicated from H&P

Premedication

Standard premedication (see [p. B-1](#)) usually is appreciated, although in patients with limited airway access, sedation may be inappropriate. If FOL is planned, pretreatment with an antisialagogue (e.g., glycopyrrolate 4 mcg/kg) is useful. Metoclopramide (e.g. 10–20 mg iv adult) will reduce the incidence of PONV 2° swallowed blood.

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Intraoperative

Anesthetic technique: GETA. Typically a nasotracheal intubation is required, using an ETT 0.5–1 mm smaller than for oral intubation. In patients with difficult airways, an awake nasal FOL is indicated. (See general discussion of [Awake FOL, p. B-5.](#))

Induction

In patients with normal airways, a standard induction (see [p. B-2](#)) with nasal intubation is appropriate. Following loss of consciousness, topical intranasal cocaine may be applied (4% on pledgets, 4 mL maximum) to shrink the nasal mucosa and for vasoconstriction. Side effects are rare, but may include ↑BP, ↑ or ↓HR, dysrhythmias, and Sz. Other topical vasoconstrictors (e.g., 0.05% oxymetazoline) may be used; however, they are also associated with cardiovascular side effects. The well-lubricated ETT is passed through the nose into the trachea, either blindly or assisted by McGill's forceps under direct laryngoscopy. The ETT is often sewn to nasal septum. The successful use of a flexible reinforced LMA in both adult and pediatric dental patients has been reported. Claimed advantages include no risk of epistaxis and no need for a throat pack, laryngoscopy or muscle relaxation. Disadvantages include interference with the procedure, throat trauma (e.g. swelling of the epiglottis) and aspiration risk.

Maintenance

Standard maintenance (see [p. B-2](#))

Emergency

NB: throat packs must be removed prior to extubation. An LMA is typically removed after the patient is awake and able to follow commands.

Blood and fluid requirements

IV: 18 ga ×1

NS/LR @ 4–6 mL/kg/h

Standard monitors (see [p. B-1](#))

Monitoring

and pad pressure points
eyes

Positioning

Postoperative

These patients may swallow blood, with consequent N&V. Rx: metoclopramide 10 mg iv.

Complications

Airway obstruction 2° retained throat pack
PONV

Always check for retained throat pack in patients exhibiting symptoms of airway obstruction

Pain management

Oral analgesics (see [p. C-2](#))

Suggested Reading for Dental/Oral Surgery

1. Atan S, Ashley P, Gilthrope MS, et al: Morbidity following dental treatment of children under intubation general anaesthesia in a



day-stay unit. *Int J Paediatr Dent* 2004; 14(1):9–16.

2. Boren E, Teuber SS, Naguwa SM, et al: A critical review of local anesthetic sensitivity. *Clin Rev Allergy Immunol* 2007; 32(1):119–28.
3. Dolwick MF, Kretzschmar DP: Morbidity associated with the preauricular and perimeatal approaches to the temporomandibular joint. *J Oral Maxillofac Surg* 1982; 40(11):699–700.
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11. Sakamoto H, Karakida K, Otsuru M, et al: Antibiotic prevention of infective endocarditis due to oral procedures: myth, magic, or science? *J Infect Chemother* 2007; 13(4):189–95.
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16. Wilson W, Taubert KA, Gewitz M, et al: Prevention of infective endocarditis: guidelines from the American Heart Association: a guideline from the American Heart Association Rheumatic Fever, Endocarditis and Kawasaki Disease Committee, Council on Cardiovascular Disease in the Young, and the Council on Clinical Cardiology, Council on Cardiovascular Surgery and Anesthesia, and the Quality of Care and Outcomes Research Interdisciplinary Working Group. *J Am Dent Assoc* 2007; 138(6):739–45, 747–60.