Basic principles of Surgery

Definition .

- Oral and maxillofacial surgery is a surgical branch,to correct wide spectrum of diseases,injuries defects in the head,neck,face,jaw region and the hard and soft tissues of the oral and maxillofacial region[Association of oral and maxillofacial surgeons of india(AOMSI)].

It deals with the art of diagnosis and treatment of various diseases,injuries and defects involving the orofacial region.

Principles of minor oral surgery

1. Developing a surgical diagnosis
2. Basic necessities for surgery
3. Aseptic technique
4. Incision planning
5. Flap design
6. Tissue handling
7. Hemostasis
8. Dead space management
9. Decontamination and debridement
10. Suturing
11. Edema control
12. Postoperative infection and pain control
13. Patient’s general health and nutrition

Developing a Surgical Diagnosis

1. First identify the clinical problem
2. Carry out thorough logical reasoning and use the available data
3. Establish the relationship between the individual problems
4. Obtain the presurgical evaluation data:

■ Patient’s physical, laboratory and imaging examination data

■ Possible etiological factors for the lesion development

■ The thorough history of lesion.

Basic Necessities for Surgery

1. The main requirements for any surgery are adequate visibility and assistance.
2. Adequate Access
3. Proper equipment

1) Asepsis' and Sterilization

Asepsis and sterilization should be followed to prevent the entry of germs into a surgical wound by the instruments, material used for surgery and from the environments.

Asepsis

It is the avoidance of pathogenic organisms. It is the term used to describe methods, which prevent contamination of wounds and other sites,by ensuring that only sterile objects and fluids come into contact with them, and that the risk of airborne contamination is minimized.

Sterilization

It is the process of destruction or removal of all microbial forms either in vegetative or spore state.

Sterilization

Physical methods

Dry heat

Moist heat

Uv light

Ionising radiation

etc.

Chemical methods

Formaldehyde

Phenolics,Quaternary ammonium compounds

Chlorhexidine,Sodium hypochlorite

Ethylene dioxide ,Glutaraldehyde,etc

A) Dry heat sterilization

1.)open flaming:
The instruments are held over the open spirit flame.

2.)Hot air oven:
The conventional ovens are electrically heated and a blower forces the hot air in motion around the items to hasten up the heating and to ensure uniform temperature in all the corners of the oven. The early models attained the temperature of 160° to 170°C for 2 hours. Articles that can be sterilized-Metallic instruments, powders, oils, greases, culture media and glass articles.

B) Moist Heat Sterilization

1) Boiling:

The temperature of boiling water does not rise above 100°C (212°F) and thus, only vegetative microorganisms are killed and the bacterial spores may survive this procedure.Before the instruments are put in a boiler, it is desirable to clean all the instruments.The instruments to be sterilized are dipped in boiling water for a period of one hour. Sodium carbonate (2%) may be added to the water for alkalinization which elevates the boiling point of water, reduces sterilization time and prevents corrosion of instruments

2)Autoclaving

This is the means of moist heat sterilization. It is a method of choice for sterilization of instruments as it reliably eliminates even resistant, spore forming microorganisms, fungi, viruses, alongwith vegetative microorganisms. It works on the principle of ‘steam under pressure’.It provides moist heat in the form of saturated steam under pressure. The pressure increases the boiling point of water. Roughly for every 5 lbs. pressure, the boiling point of water rises by 10°C by increasing the latent heat of energy for boiling of water. Hence, at 15 lbs. pressure the boiling point of water rises to 121°C.

Front loading autoclave

Vertical loading

Mechanism of action

The steam is the mixture of heat and water vapor. When it comes in con tact with any cool surface, it gets condensed and heat is released from water. This heat is taken up by the surface it comes in contact with. The heat goes on penetrating in the deeper layers of the object. Hence, the steam must come in contact with the objects that are to be sterilized and thus, the objects must not be sealed in plastic wrappers or in the nonporous metallic containers. The steam and the air move in vertical direction and therefore the movement will be quicker and thereby the penetration of the steam into the material will also be better if the articles are placed vertically in the autoclave.

3) Chemiclaving

It is also called chemical vapor sterilization. A combination of formaldehyde, alcohols, acetone, ketones and steam at 138 KPa

C)Cold Sterilization

Articles to be sterilized are immersed in the chemicals for achieving sterilization. The commonly used agents for chemical sterilization are absolute alcohol, carbolic acid 2 percent, glutaraldehyde 2 percent (Cidex), formaldehyde, chlorhexidine gluconate, ethylene trioxide (ETO).

Articles that can be sterilized:

Sharp instruments like scissors, blades and suturing needles.

The following articles can be sterilized in ETO chamber, as immersion in liquids may spoil them.

• Splints• Templates• Handpieces• Fiber Optic cables• Micromotor cords.

Articles that cannot be sterilized:

Gauze, cotton, gloves, indwelling catheters, syringes, hypodermic needles, etc.

Antiseptic Solutions

KORSOLEX- comp : Glutaraldehyde –7 g •1,6 dihydroxy 2,5 dioxahexane8.2g

(chemically bound formaldehyde) • Polymethyl urea derivatives–17.6 g • Rust inhibitors (trade secrets). Disinfection of heat sensitive instruments

STERILLIUM -comp: 2Propranolol: 45 g 1Propranolol : 30 g• Ethyl hexadecyl dimethyl ammonium ethyl sulphate: 0.2 g• Skin protecting substances.For the hand disinfection 3 mL solution to be rubbed for 30 seconds.

Sodium hypochlorite:—rapid action (3 minutes) surface disinfectant, highly corrosive and has strong odor. A solution of one part of 5% sodium hypochlorite with nine parts of water is used. It is used for cleaning floors, plastic surfaces, tools etc

Others - **DETTOL,SAVLON,WEAK IODINE SOLUTION ,SPIRIT,HYDROGEN PEROXIDE,FORMALIN SOLUTION** etc.

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CARE OF ANTISEPTIC SOLUTION

Do’s

- **Always use recommended dilutions before use, as directed.**
- **Always prepare dilutions in small volumes, preferably not more than 1 liter.**
- **Always ensure that the mouth of the bottle is not touched by hands or other materials while pouring**

Don'ts

1.Never mix up old diluted solutions with the freshly prepared ones.

2.Never leave diluted solutions for more than one working day.

3.Never leave bottles open.

Handling of sterilized instruments

The autoclaved instruments kept in the dressing drum need to be handled carefully to prevent contamination of the instruments and preserve the sterile environments inside the drum and it should be air tight,should be closed immediately after removing sterilized instruments.

Instruments should be handled using cheatle forceps, which is kept in a antiseptic solution.

Aseptic Technique

Aseptic technique: It aims at excluding all microorganisms. Surgical technique is aseptic when sterile instruments and clothing and “no touch technique” are employed. It is the term used to describe methods which prevent contamination of wounds and other sites by ensuring that only sterile objects and fluids come into contact with them, and that the risks of airborne contamination are minimized.

Aseptic technique

It consists of -

- Planning and design of operating room.
- Preparation of environments in the operating room.
- Preparation of personnel.

– Preparation of patient.

– Preparation of surgical team.

- Disposal of hospital waste.

Planning and design of operating room

Location of the operating room should be isolated from rest of the hospital unit.

Operating room should be divided into unrestricted,semi-restricted and restricted area

Unrestricted area :

Pre-anesthetic room , Offices ,Toilets ,Changing areas

Semi-restricted area

Surgeon rooms, Anesthetist rooms, Nurses room,minor OT

Restricted area

Operating room (OR) Scrub area

Sterile storage room Surgical ICU

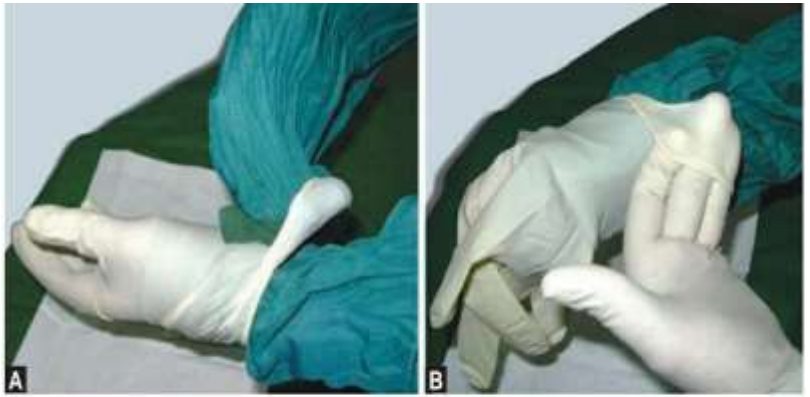
Designing of an operating room

- The size of the operating room should be adequate for housing all the equipment and accessories.
- It should allow free movement of the surgical team members.
- Ideally the size of the OR should not be less than 500 sq ft. The operating room should be designed in such a way that the floors and walls should be absolutely plain and easily cleanable
- The OR complex should have only one entry and all the windows should be airtight. This prevents multi directional air flow and entry of dust in the OR.
- The temperature in the OR must be maintained to around 20°C and relative humidity should be less than 40 percent.

Preparation of Personnel

The special scrub suit to be worn as a part of universal precaution kit consists of water resistant material and has double layered protection . Before performing the surgery the surgeon and assistants must scrub their hands and put on the sterile gown and sterile gloves.

- **Strokes during hand scrubbing**



Figs 1.16A and B: Closed gloving technique—note the left glove is slided over the hand with the right hand overed by sterile gown. The right cuff is then adjusted with gloved left hand and the right glove is slided using left gloved hand without touching the outside of the gloves with bare hands

How to wear sterile gown

Figs 1.20A to D: De-gowning process, note that the gown is removed first with removing glove, the inside of the gown is not touched with contaminated gloves. Gow always removed first and then gloves are removed

- Sterile gown is picked up by the assistant with the help sterile cheatle forceps.
- The surgeon holds the gown with clean hands touching the inside of the gown which is folded outside.
- He opens the gown and slides the gown over his hands and the body without touching the outside of the gown.
- Removing the gown
- • Grasp the right shoulder of the loosened gown with the left hand and pull the gown downward from the shoulder and of the right arm, turning the sleeve inside out.
- • Turn the outside of the gown away from the body with flexed elbows.
- • Grasp the left shoulder with the right hand and remove the gown entirely, pulling it off inside out
- • Discard in a laundry hamper or in a trash receptacle (if disposable).

How to remove gloves

Figs 1.21A and B: De-gloving process, the contaminated gloves are removed without touching the outside of the glove with bare hands

- Grasp the cuff of the left glove with gloved fingers of the right hand and pull it off inside out.
- Slip the ungloved fingers of the left hand under the cuff of the right glove and slip it off inside out.
- Discard gloves in a trash receptacle.
- Wash the hands thoroughly using antiseptic soap.

Preparation of patient

: Before surgery

In maxillofacial surgery preparation of oral cavity is very important to prevent wound infection. The oral cavity should be thoroughly inspected for any septic foci, calculus, tarter,infected carious teeth, infected periodontal pockets, etc. and they should be treated/removed. Antiseptic mouthwashes should be prescribed (chlorhexidine, povidon, iodine, etc.) for periodic mouth rinsing to reduce the count of micro organism. Loose teeth should be extracted as they may come in the way of intubations of patient and may get knocked out and aspirated during the intubation.

Preparation of area of surgery Just prior to surgery

The part on which the surgery is to be performed and its adjoining area is scrubbed vigorously using sterile swab soaked in betadine by using forceps with a no touch technique, i.e. the surgeon does not touch the swab or any other area with his gloved hands for about 2 minutes.The scrubbing is started from the center and goes to periphery and the swab is discarded).

Incision Planning

1)INCISION

Incision is needed during the surgery for creating an access.

The incision is made with sharp Bard Parker knife. In oral and maxillofacial surgery the commonly used BP handled number 3 to 5 on which 15 blade is mounted. Stab knife (No. 11 blade) is used for incision and drainage of abscess, inserting drains or taking gingival crevicular incisions.

Figs 1.22A and B: Different types of Bard-Parker handles and blades

Principles of incision

The sharp blade of a proper size and shape should be selected; essential for clean, single stroke incision without much tissue damage.

1.Incision should be placed on the sound bone, or away from the surgical area to ensure the prevention of wound dehiscence

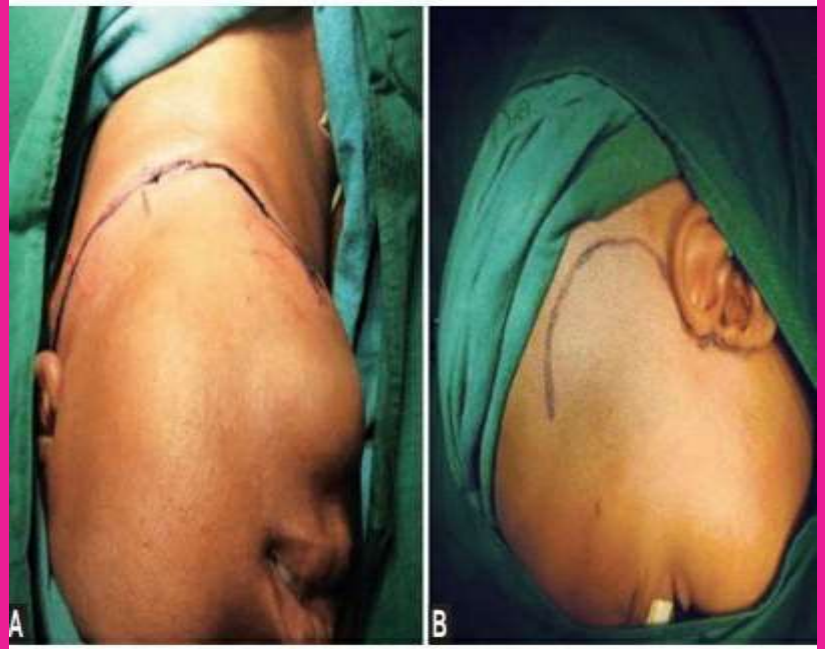
2. Either pen (intraoral incision) (Fig. 19.3) or table knife (extraoral incision) grasp is used with proper support and pressure to produce uniform atraumatic clean incision, with predictable depth

3.The skin or the mucosa to be incised, should be stabilized with finger pressure to guide the passage of the blade

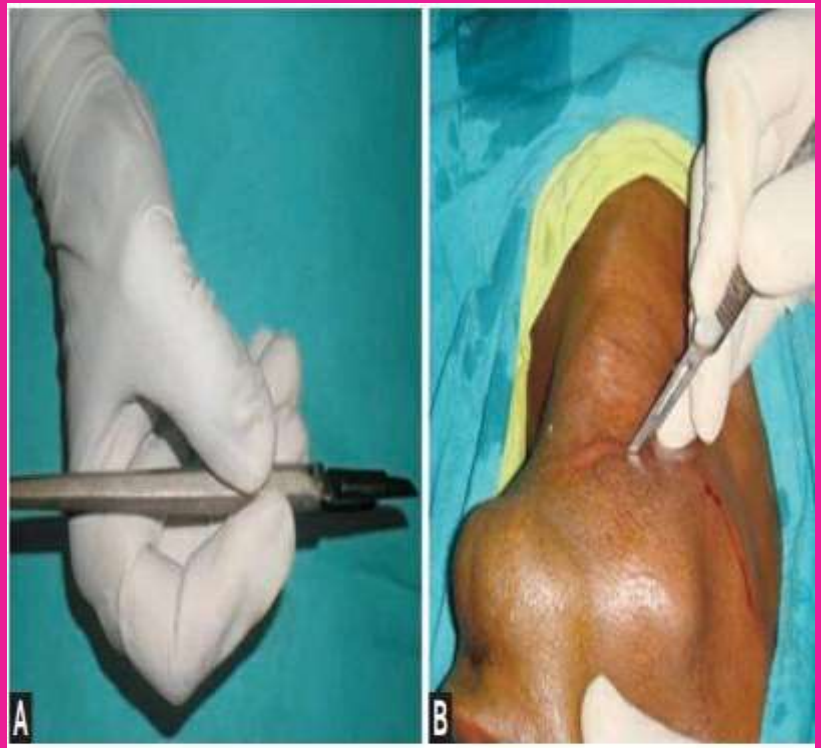
4.A firm continuousp stroke should be used. Repeated strokes increase both the amount of tissue damage and

the bleeding, thereby impairing the wound healing..

5.No sharp angles; the change in direction is accomplished by a gradual curve. Sharp angles tend to produce slough due to poor circulation and may lead to extensive scarring.



Figs 1.23A and B: Marking the incision with ink

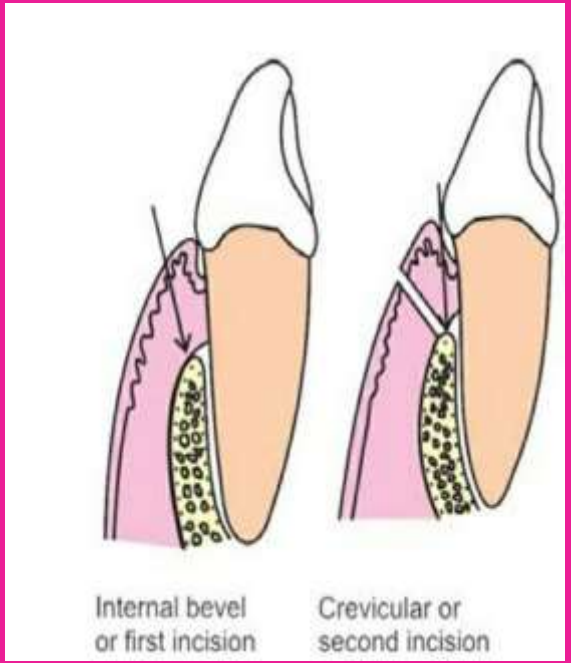


Figs 1.24A and B: Pen grip

Types of incisions

A)Horizontal: It is seldom used because of natural contour of maxilla and mandible. These types of incisions are directed along the gingival margin either mesially or distally:

1.Internal bevel incision:
It starts at distal area from the margin and is aimed at bony crest.



2.Crevicular incision: It starts at the bottom of the pocket and is directed to the bony margin. These incisions are mainly used in periodontal flap surgeries.

B)Vertical: Vertical or oblique incisions are most desirable and are also called as releasing incisions, on one or both the sides of the flap. It may be single resulting in triangular type of flap:

1.Double vertical incisions on both sides of the flap will result in trapezoidal flap

2.The incisions should extend beyond mucogingival line reaching the alveolar mucosa to allow the release of a flap for reflection

Ward i

It consists of mesial release, crevicular and distal incisions. Mesial release incision begins from approximately 5 to 6 mm below marginal gingiva of lower second molar at the mesial root and runs upwards obliquely at an angle of 45° to the distobuccal line angle of the second molar and extends posteriorly cutting the distal papilla and then into the crevice of the third molar, if it is partially erupted

Ward ii

It consists of mesial release, crevicular and distal release incisions. Mesial release incision begins from approxi mately 5 to 6 mm below marginal gingiva of lower first molar at the distal root and runs upwards obliquely at an angle of 45° to the mesiobuccal line angle of the second molar and extends distally into the crevice of the second molar up to its posterior surface and then distally it extends on the anterior border of the ramus of the mandible for a distance of 10 mm

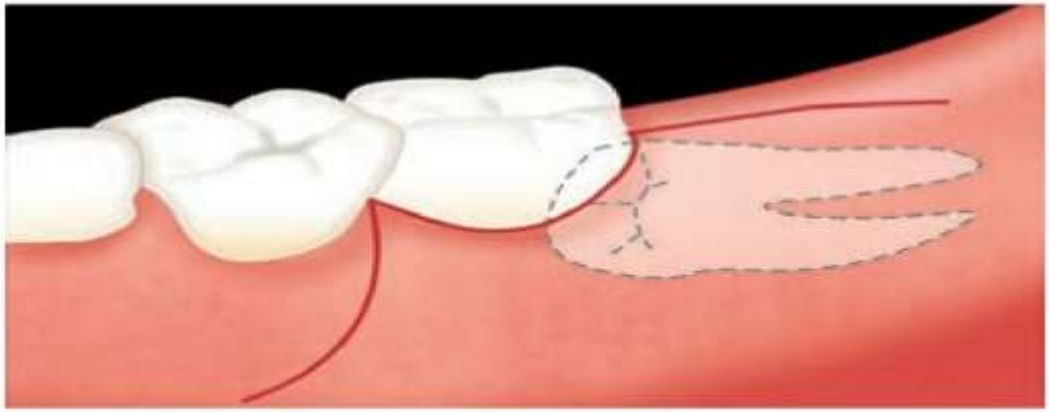


Fig. 3.5: Ward II incision

Semilunar Incision

Semilunar incision is a slightly curved halfmoon shaped incision in the alveolar mucosa. It prevents incision and reflection of the marginal and papillary gingiva thus avoiding compli cations thereof. However, it causes more bleeding, delayed healing and scarring of mucosa.

indications

It is used for apicectomy of teeth and apical curettage

2) FLAP DESIGNING

Whenever a flap is required to be reflected during the surgery for creating an access to the surgical site following basic principles of flap designing must be adhered to:

• The base of the flap must be wider than the apex to ensure good afferent and efferent vascularity.

• The flap should be wide enough to facilitate free, passive and direct access and should cover the surgical defect adequately.

• Should be raised Full thickness

• Include or exclude gingival papilla

• The edges must lay on healthy bone at the time of closure.

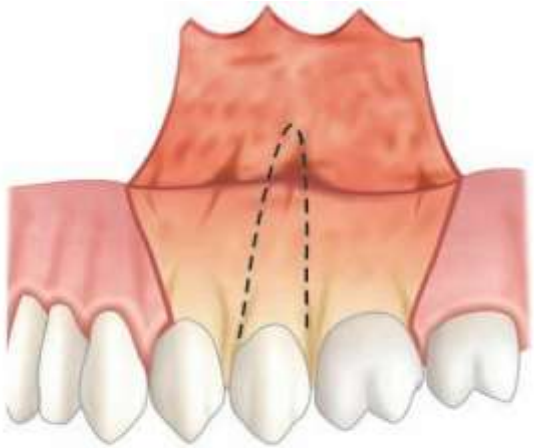


Fig. 1.25: Base of the flap wider than the apex

Types of Flaps

A. Full thickness—mucoperiosteal flap

-Partial thickness

B. Envelope flap

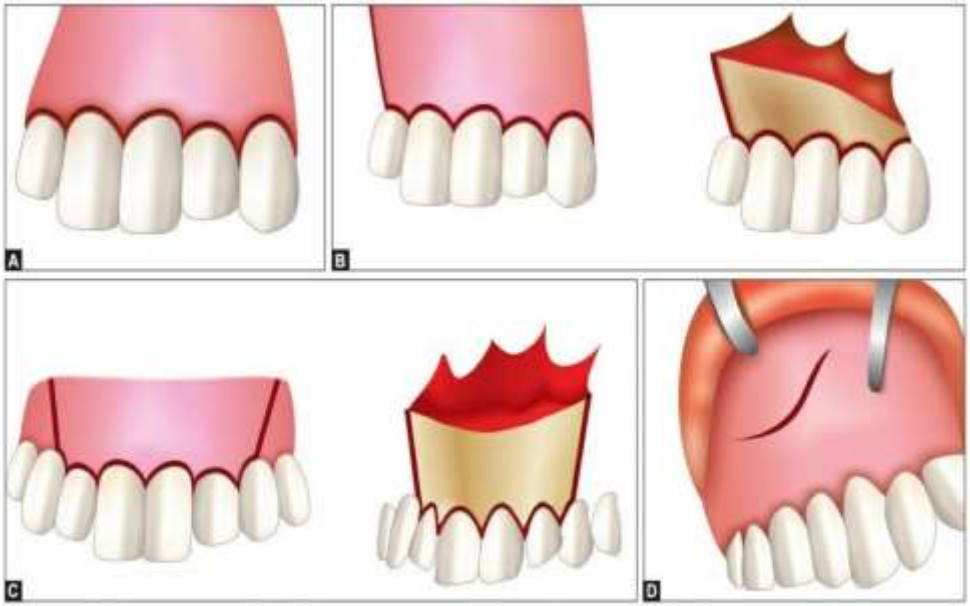
-Two-sided triangular flap

-Three-sided rhomboid flap

-Semilunar flap.

C. Labial, buccal flaps

-Palatal, lingual flaps



Figs 19.4A to D: Types of flaps: (A) Gingival margin crevicular incision; (B) Two-sided triangular flap; (C) Three-sided rhomboid flap. Note that the base should be wider than height and (D) Semilunar flap

Tissue Handling and Tissue Respect

“Respect the tissue and it will reward you by providing uncomplicated healing”

The gentle handling of the tissue during the surgery is of paramount importance for uneventful wound healing and achieving desirable results out of the surgical procedure. The forceful retraction of the tissue, rough handling, injudicious dissection, excessive use of electrocautery, using dull scissors/ knife for incision and allowing the tissue to desiccate during the surgery, All of these can result in tissue necrosis and infection. Therefore proper precautions should be taken during all the step of surgical procedure.

Tissue retraction

The tissues are required to be retracted during the surgery to facilitate good visibility and access to the surgical site..

Soft, friable tissues tend to get lacerated if retracted forcefully or using traumatic retractors like Allie's forceps or cat's paw retractor. Instead atraumatic retractors like Langenbeck's (L) retractor should be used.

During intraoral procedures the mouth is kept open using a mouth prop or a self retaining Doyen's, Hyster's or Dingman mouth gag

Figs 1.26A and B: Doyen's mouth gag

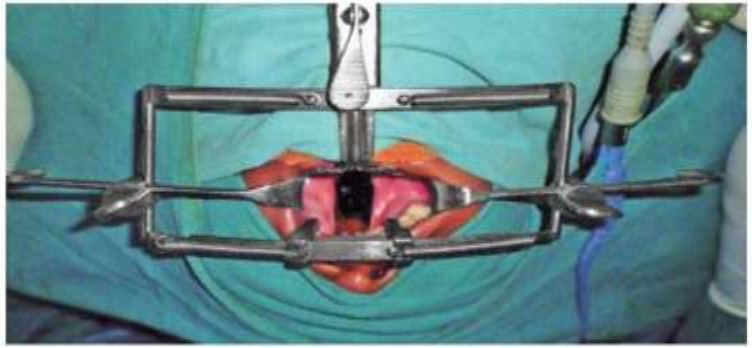


Fig. 1.27: Dingman's mouth gag

Some commonly used retractors in oral and maxillofacial surgery are condylar retractor (for condylectomy), mastoid retractor (self retaining), coronoid retractor (forked L retractor) for coronoidectomy of ramal osteotomies, chin retractor for the genioplasty, and the Austins retractor during third molar surgeries, etc.

Dead Space

Dead space is the area that remains devoid of tissue after closure of the wound. It is created as a result of removal of tissue in the depths of a wound or by not suturing in multiple layers (single layer approximation). Dead space is usually filled with hematoma.

How to Avoid a Dead Space?

1. Multiple layer suturing from the depth to the surface
2. Use of pressure dressing over the wound in the postoperative period for 12–18 hours
3. Use of surgical packing of the defect. Whenever proper approximation of the margins is not possible the strip or the ribbon gauze impregnated with an antibacterial medication can be used
4. Use of drains alone or along with the pressure dressings
5. Nonsuction drains or suction drains can be used.

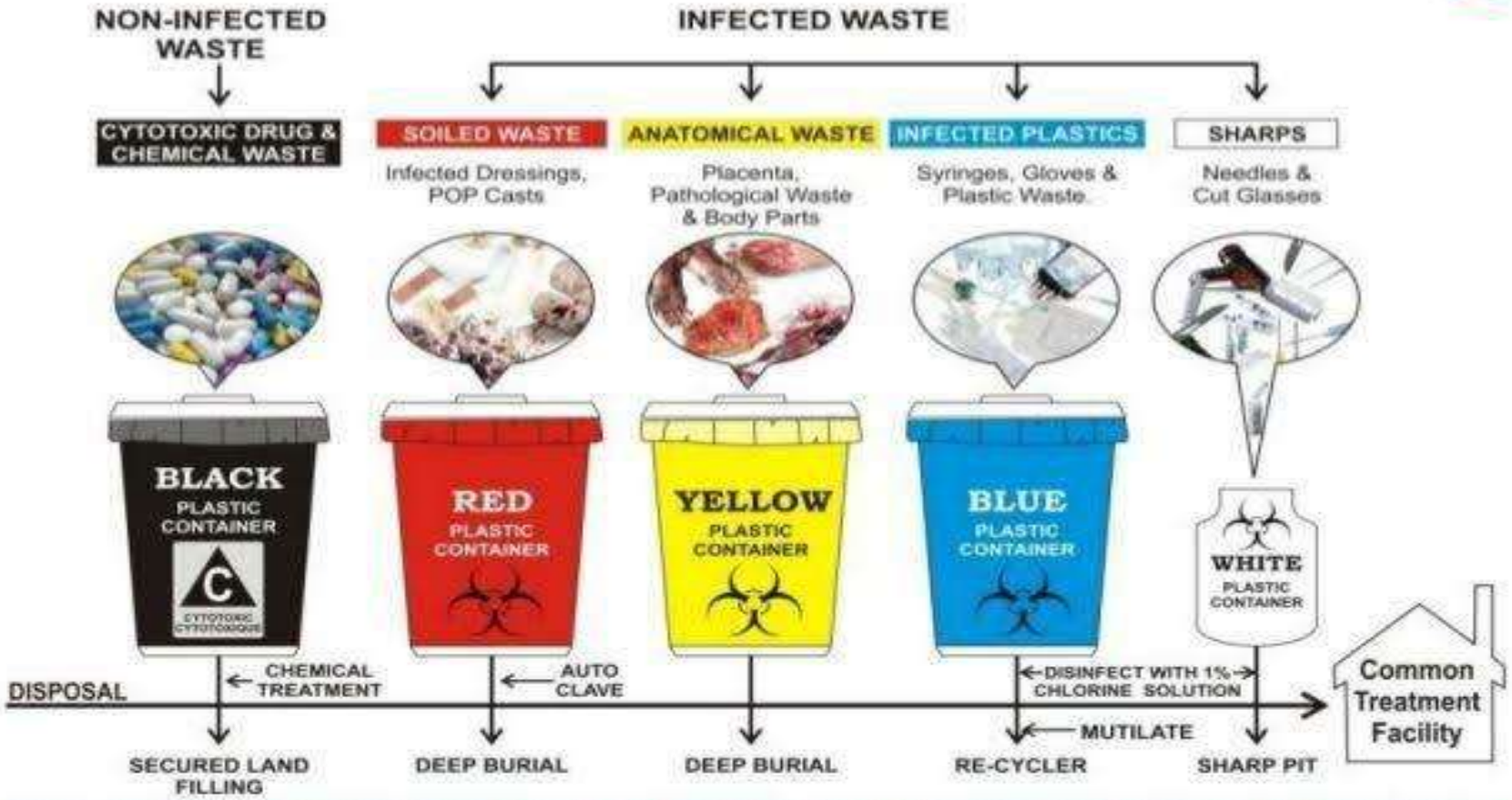
Decontamination and Debridement

1. Irrigation during surgery
2. Irrigation at the end of surgery
3. Careful debridement of necrotic tissue, foreign bodies, severely injured tissues
4. Antibiotic prophylaxis.

In intraoral wounds, patients should be instructed to use frequent medicated mouthwashes after every food intake.

In extensive oral surgical wounds, the patient should be fed through Ryle’s tube till the wound heals to avoid oral contamination.

SEGREGATION OF SOLID BIO-MEDICAL WASTE



NOTE:- USE ANY COLORED BIN OTHER THAN BLACK, RED, YELLOW, BLUE & WHITE FOR DISPOSAL OF GENERAL WASTE

References:

-Rajiv M Borle .textbook of oral and maxillofacial Surgery

-Neelima Malik 4th edition

Thank you ..