



Cryosurgery & Laser Surgery

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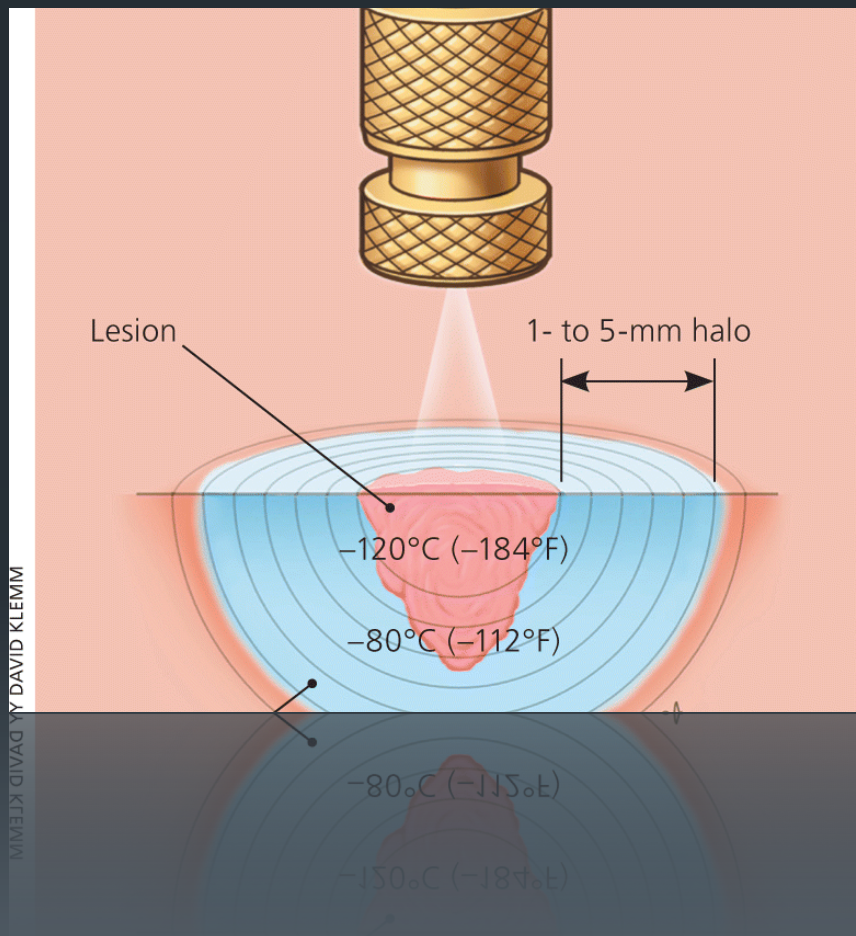
Introduction

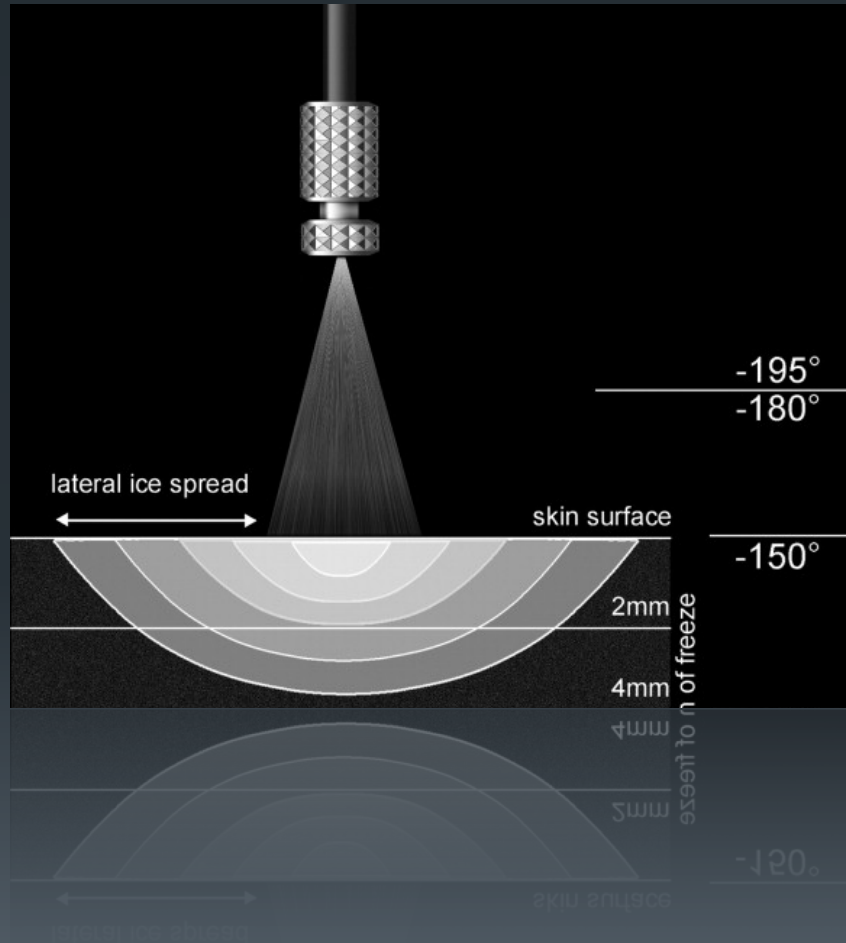
- The use of scalpel to cut or excise tissue during surgical procedures may consider the conventional methods for treatment. But the use of cold & laser application may help coagulation of the bleeding from the excised tissue.

Cryosurgery

- It is rapid freezing & thawing of tissues cause cell death & necrosis. Cryosurgery is thought to cause ice crystals in & around cells causing disruption of cell membranes and contents. by using liquid nitrogen









Action of Cryosurgery

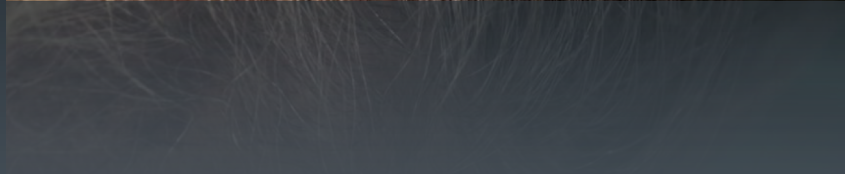
1. Freezing of the tissues.
2. Thawing of the tissues.
3. Reduced blood flow.
4. Vascular damage results in ischaemic necrosis.

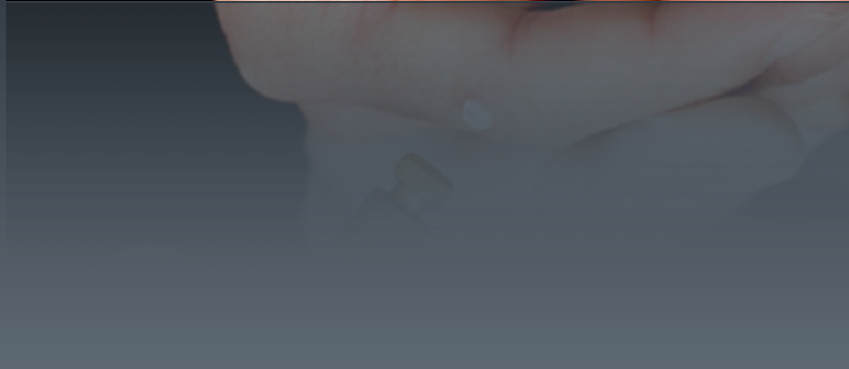
Uses of Cryosurgery

1. Ablation of warts & small tumors.
2. Ablation of haemangiomas.
3. . Treatment of bony cavities.
4. Blocking of nerves.

Ablation of warts & small tumors:

- Treated of these lesions are done by Freezing action which lead to viral warts necrosis and vascular lesions regress.





Ablation of haemangiomas

- The use of freezing action may cause non-bleeding of the treated such lesion with significant oedema and unusual post-operative pain.

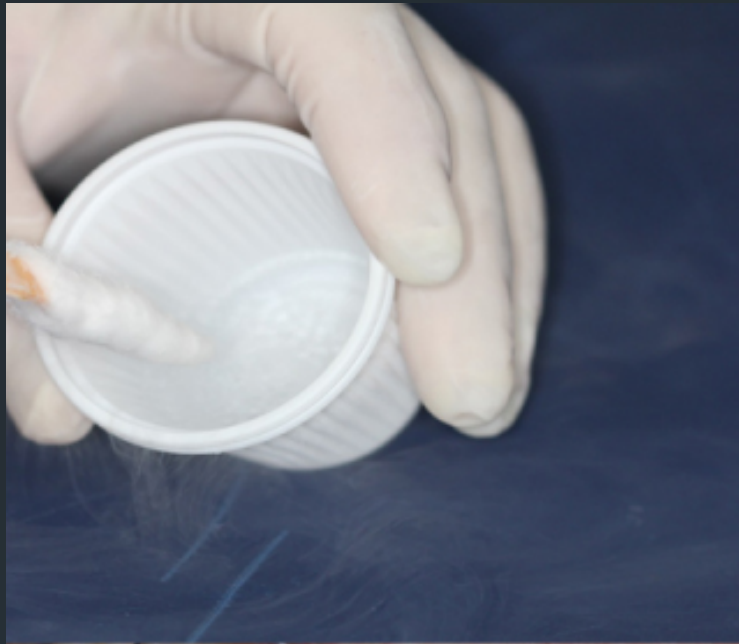


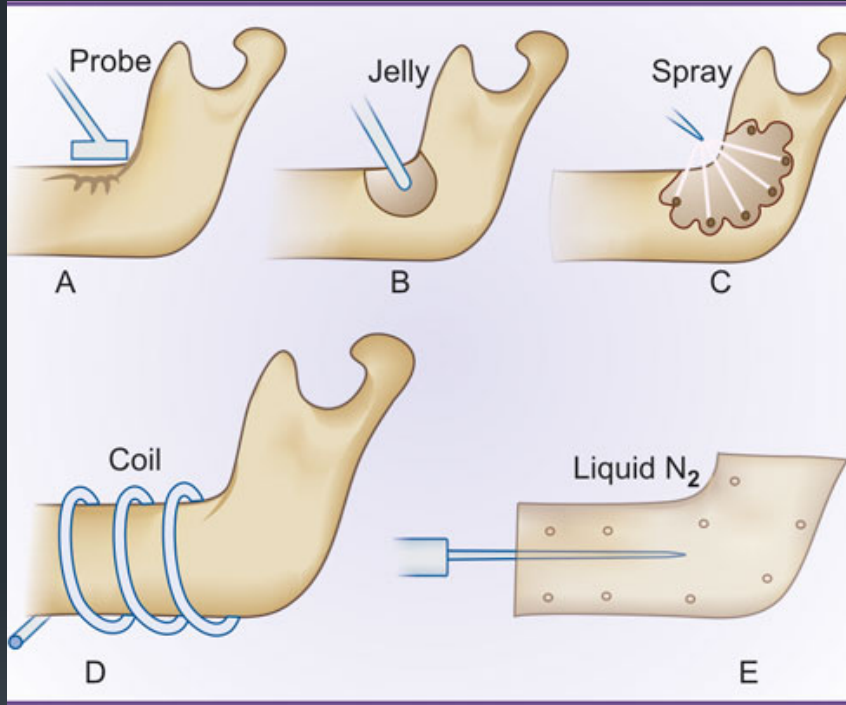
Fig.2b



Fig.2d

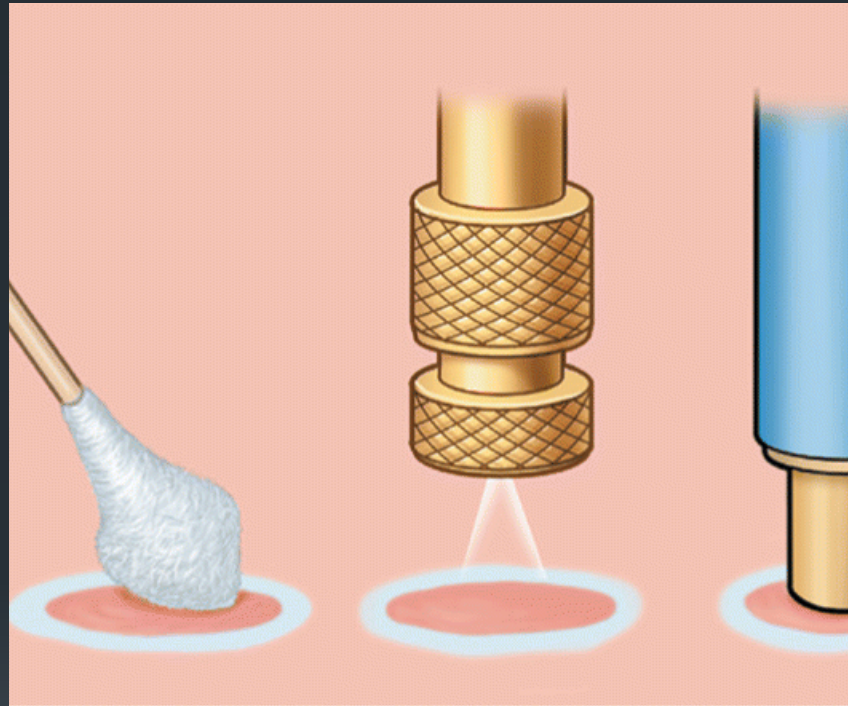
Treatment of bony cavity

- Bone cavities may be treated to reduce recurrence of lesions such as odontogenic keratocysts or central giant cell granulomata.
- The bone is devitalised but still remains functional until it is replaced by vital tissue.



Blocking of nerves

- Cryosurgery is also used to treat painful nerve lesions because nerves can be blocked without causing the secondary neuralgia that often follows nerve section, avulsion or alcohol blocks.
- Pain relief lasts for several months but repeat treatments are required. Cryosurgery is also treated trigeminal neuralgia after surgical exposure when failed to treat by medication therapy like Carbamazepine.



Advantages of Cryosurgery

1. No hemorrhage.
2. Minimal postoperative pain.
3. Good recovery of nerve function.
4. Minimal scarring.
5. Maintaining bone structures.
6. Recovery of blood vessels.
7. Recovery of normal adjacent tissues.

Disadvantages of Cryosurgery

1. Can not be used to cut tissues.
2. Cause excessive swelling..
3. Not effective for lymphangiomas.



LASER Surgery

Definition

- LASER is an acronym for “*L*ight *A*mplification by *S*timulation *E*mission of *R*adiation”.



■ Advantages of Laser:

1. Ability to coagulate.
2. Ability to vaporize.
3. Incise tissue based on its power and the time of application on tissue.

■ Disadvantages of Laser:

1. Radiant energy hazard to the patient.
2. Surgeons & operative team from advertent exposure, resulting in:
A-Laser skin burns. b. Eye damage. c. Blindness.
3. Injury or death of the patient from ignition of endotracheal tubes by errant Laser energy which was fueled by anesthetic gases used during surgery.
4. The great expense of Laser equipment & service fees, the need for additional training of the surgeon and operating team.

Types of Laser

1. Carbon dioxide (CO₂ Laser).
2. Neodymium: YAG Laser.
3. Argon Laser
4. Helium-neon Laser.
5. 5. Dye Laser.



■ 1. Carbon dioxide Laser:

Has an ideal properties for soft tissue surgery.

Uses of CO2 Laser:

1. Removal of tumor in gynaecology.
2. Oral surgical applications.
3. In ENT applications

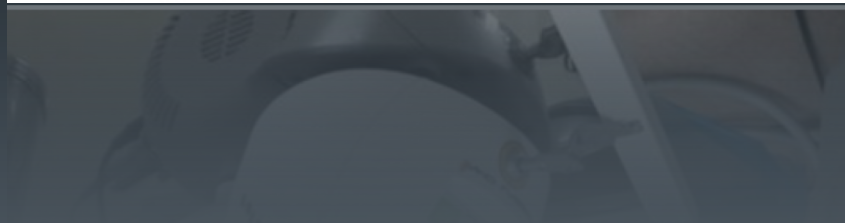


Oral Surgical Applications

1. White patches & premalignant lesions
2. Erythroplakia & Leukoplakia
3. Erosive lichen planus
4. Denture induced hyperplasia
5. Squamous cell carcinoma









■ **Advantages of CO2 Laser:**

1. Excision of wide areas with minimal scarring.
2. Hemostasis (blood less field).
3. No significant swelling.
4. Moderate post operative pain.
5. Safe on malignant & premalignant lesions.
6. Not needed for skin graft.



2-. Neodymium : (Nd:YAG) Laser:

1. Tumor removal in oral surgery.
2. In gynecology.
3. Treated peptic ulcers.
4. Used for fissure sealing, caries, enamel & bone cutting.
5. Treated of varicose vein.



■ 3. Argon Laser:

This Laser produce visible light that absorbed by melanin pigments.

1. Treated vascular lesions.
2. Used in intraocular surgery.
3. Treated blood coagulation.
4. Treated middle ear lesions.
5. Used for curing of composite.



■ 4. Helium-neon Laser:

1. It produces a low-power, red, aiming beam for some invisible Lasers & are useful pointers in the lecture theatre.
2. For diagnosis of caries.
3. Stimulation of wound healing.



■ **5. Dye Lasers:**

1. Treated of vascular lesions.
2. Removal of tattoo.
3. for photodynamic therapy.
4. Treated dentin sensitivity.



- **6. KTP Lasers:**

- 1. Treated telangiectasia & coagulation of larger vessels.
- 2. Tonsillectomy.
- 3. Urethral strictures.
- 4. Bladder surgery.
- 5. Salivary duct strictures.



- **7. Other Lasers Erbium: YAG:**

- 1. Skin resurfacing.
- 2. Removal caries.
- 3. Enamel, dentin, & bone cutting.