ACS(I) PROCEDURAL DERMATOSURGERY

A Step by Step Approach

Editors
Biju Vasudevan
Manas Chatterjee
Shilpa K

Assistant Editors
Divya Gorur
Madura C
Savitha AS
Shekhar Neema
Harish Prasad
Sujala S Aradhya

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Editors

Biju Vasudevan
MD FRGUHS (Dermatosurgery)
Professor (Derm & Ven)
Base Hospital Lucknow
Lucknow, Uttar Pradesh, India

Manas Chatterjee MD
Professor and Head
Department of Dermatology
INHS Asvini
Mumbai, Maharashtra, India

Shilpa K MD FRGUHS (Dermatosurgery)
Assistant Professor
Bangalore Medical College and Research Institute
Bengaluru, Karnataka, India

Assistant Editors

Divya Gorur MD FRGUHS
Senior Resident
Department of Dermatology
Bangalore Medical College and Research Institute
Bengaluru, Karnataka, India

Savitha AS MD
Assistant Professor
Department of Dermatology
Sapthagiri Institute of Medical Sciences
Bengaluru, Karnataka, India

Madura C MD FRGUHS (Dermatosurgery)
Consultant Dermatologist, Dermatosurgeon and
Hair Transplantation Surgeon
Cutis Academy of Cutaneous Sciences
Bengaluru, Karnataka, India

Shekhar Neema MD
Assistant Professor
Department of Dermatology
Command Hospital
Kolkata, West Bengal, India

Harish Prasad MD FRGUHS
Consultant Dermatologist
Apollo and HCG Cancer Hospital
VITALS Klinic
Bengaluru, Karnataka, India

Sujala S Aradhya
MD (DVL) FRGUHS (Dermatosurgery)
Consultant Dermatologist and Dermatosurgery
Sujala Polyclinic and Laboratory
Bengaluru, Karnataka, India

Foreword
Dr (Col) Manas Chatterjee MD

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Jaypee Brothers Medical Publishers (P) Ltd

Headquarters

Jaypee Brothers Medical Publishers (P) Ltd
4838/24, Ansari Road, Daryaganj
New Delhi 110 002, India
Phone: +91-11-43574357
Fax: +91-11-43574314
E-mail: jaypee@jaypeebrothers.com

Overseas Offices

JP Medical Ltd
83 Victoria Street, London
SW1H 0HW (UK)
Phone: +44 20 3170 8910
Fax: +44 (0)20 3008 6180
E-mail: info@jpmedpub.com

Jaypee Brothers Medical Publishers (P) Ltd
17/1-B, Babar Road, Block-B, Shyamoli
Mohammadpur, Dhaka-1207
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Our families, teachers, students and patients

Editorial Advisory Committee

Contributors

Aarti Sarda MD
Senior Resident
KPC Medical College
Kolkata, West Bengal, India

Abhilasha MD MD
Junior Resident
Rajarajeshwari Medical College and Hospital
Bengaluru, Karnataka, India

Abhishek De MD FAGE
Associate Professor
Calcutta National Medical College
Kolkata, West Bengal, India

Akshi Bansal MD
Department of Dermatology
Bangalore Medical College and Research Institute
Bengaluru, Karnataka, India

Aman Dua MD
Consultant Dermatologist and
Hair Transplant Surgeon
AK Clinics Pvt Ltd
Ludhiana, Punjab, India

Amit Kerure
Consultant Dermatologist
Mumbai, Maharashtra, India

Anagha Ramesh MD
Consultant Dermatologist
Bengaluru, Karnataka, India

Aneesh KP MBBS
Senior Resident
Department of Dermatology
Base Hospital Lucknow
Lucknow, Uttar Pradesh, India

Ankan Gupta MD DNB
Assistant Professor
Department of Dermatology
Christian Medical College
Vellore, Tamil Nadu, India

Anupam Das MD
Assistant Professor
KPC Medical College and Hospital
Kolkata, West Bengal, India

Avitus John Prasad DDVL
Managing Director
SP Derma Center
Madurai, Tamil Nadu, India

Biju Vasudevan MD FRGUHS (Dermatosurgery)
Professor (Derm & Ven)
Base Hospital Lucknow
Lucknow, Uttar Pradesh, India

Bipin Deshpande DVD FAAD (USA)
Chaitanya Clinic
Dahanukar Colony and Head
Department of Cosmetology
Noble Hospital
Pune, Maharashtra, India

BM Shashikumar MD FIADVL (Dermatopath)
Associate Professor
Department of Dermatology
Mandya Institute of Medical Sciences
Mandya, Karnataka, India

BS Chandrashekar
Chief Dermatologist and Medical Director
Cutis Academy of Cutaneous Sciences
Bengaluru, Karnataka, India

Chaithra Shenoy
Consultant Dermatologist and Cosmetologist
Cutis Academy of
Cutaneous Sciences
Bengaluru, Karnataka, India

Chander Grover MD DBM MNAMS
Professor
Dermatology and STD
University College of Medical Sciences and
Guru Teg Bahadur Hospital
New Delhi, India

Debdeep Mitra MD DNB
Graded Specialist
Department of Dermatology, Base Hospital
New Delhi, India

Debjit Kar MD DVL FIADVL
Consultant Dermatologist and Dermatosurgeon
Assistant Professor
Department of Dermatology
Hi-Tech Medical College and Hospital
Rourkela, Odisha, India

Dhanashree Bhide MD
Consultant Dermatologist
Dhadphale Nursing Home
Pune, Maharashtra, India

Divya Gorur MD FRGUHS
Senior Resident
Department of Dermatology
Bangalore Medical College and Research Institute
Bengaluru, Karnataka, India

Eswari L MD FRGUHS (Dermatosurgery)
Assistant Professor
Bangalore Medical College and Research Institute
Bengaluru, Karnataka, India

Gautam Kumar Singh MD
Cl Spl (Dermatology)
Military Hospital Kirkee
Pune, Maharashtra, India

Govind Mittal MD FRGUHS (Dermatosurgery)
Consultant Dermatologist, Dermatosurgeon and
Dermatotrichologist, Excel Care Hospital
Bengaluru, Karnataka, India

Harish Prasad MD FRGUHS
Consultant Dermatologist
Apollo and HCG Cancer Hospital
VITALS Klinic
Bengaluru, Karnataka, India

Imran Majid MD
Associate Professor
Cutis Institute of Dermatology
Srinagar, Jammu and Kashmir, India

Koushik Lahiri DVD(CAL) FIAD FFAADV MRCPS(Glasgow)
FRCP(Edin) FRCP(London)
Consultant Dermatologist
Wizderm Speciality Hair and Skin Clinic
Kolkata, West Bengal, India

Kumaresan M MD Diplomate ABHRS
Professor
PSG Hospitals
Coimbatore, Tamil Nadu, India

Lakshmi DV MD FRGUHS
Senior Resident
Department of Dermatology
Bangalore Medical College and Research Institute
Bengaluru, Karnataka, India

Leelavathy B MD
Professor and Head
Department of Dermatology
Bangalore Medical College and Research Institute
Bengaluru, Karnataka, India

Madhulika Mhatre
Consultant Dermatologist
Mumbai, Maharashtra, India

Madura C MD FRGUHS (Dermatosurgery)
Consultant Dermatologist, Dermatosurgeon and
Hair Transplantation Surgeon
Cutis Academy of Cutaneous Sciences
Bengaluru, Karnataka, India

Manas Chatterjee MD
Professor and Head
Department of Dermatology
INHS Asvini
Mumbai, Maharashtra, India

Meenaz Khoja DDV
Consultant Dermatologist
GMF Ruby Hall Clinic and MMF Joshi Hospital
Pune, Maharashtra, India

Munish Paul MD Dermatology
Consultant Dermatologist
Skin Laser Centre
New Delhi, India

Nagesh TS MD DNB
Associate Professor
Department of Dermatology
Sapthagiri Institute of Medical Sciences
Bengaluru, Karnataka, India

Narendra Patwardhan MD DDV
Consultant Dermatologist
Shriyash Clinic
Deccan Gymkhana
Pune, Maharashtra, India

Nilesh Goyal MRCP DNB DVD SCS Dip
Leslie Baumann International Cosmetic Dermatology Fellow and Consultant Cosmetic Dermatologist
Juvenis Clinic, Lilavati Hospital and Bombay Hospital
Mumbai, Maharashtra, India

Nirav V Desai DNB
Dermatologist and Hair Transplant Surgeon
AK Clinics, Ludhiana, Punjab and
New Delhi, India

Nirmal B Krishna MD FRGUHS (Dermatosurgery)
Assistant Professor and Consultant
Department of Dermatology
Velammal Medical College and
Research Institute
Madurai, Tamil Nadu, India

Niti Khunger MD DDV DNB
Professor and Consultant Dermatologist
VM Medical College and Safdarjang Hospital
New Delhi, India

Nitin Barde MD FRGUHS (Dermatosurgery)
Assistant Professor
Indira Gandhi Government Medical College
Nagpur, Maharashtra, India

Pavan Raj R MD FRGUHS (Dermatosurgery)
Consultant Dermatologist and Dermatosurgeon
Cutis Academy of Cutaneous Sciences
Bengaluru, Karnataka, India

Pradeep Kumari DNB MNAMS FCPS DVD
Chief Dermatologist
Skin and Surgery International and
Asia Institute of Hair Transplant
Pune, Maharashtra, India

Pradyumna Vaidya DVD DNB
Consultant Dermatologist
Dr Vaidya's Skin and Laser Clinic
Pune, Maharashtra, India

Priyanka Agarwal MD
Senior Resident
Rajarajeshwari Medical College and Hospital
Bengaluru, Karnataka, India

Pushpa KR MD FRGUHS
Dermatologist and Dermatosurgeon
Epitome Skin and Laser Centre
Bengaluru, Karnataka, India

Raghunatha Reddy MD DNB FRGUHS
Professor and Head
Department of Dermatology
MVJMC&RC
Consultant Dermatologist and Dermatosurgeon
Dr Raghu's Mathapitha Skin Clinic
Bengaluru, Karnataka, India

Rajesh Verma MD
Professor and Head
Department of Dermatology
Base Hospital Lucknow
Lucknow, Uttar Pradesh, India

Rasya Dixit
Consultant Dermatologist
Dr Dixit Cosmetic Dermatology Clinic
Bengaluru, Karnataka, India

Revathi TN
Professor
Department of Dermatology
Bangalore Medical College and Research Institute
Bengaluru, Karnataka, India

Satish Udare
Consultant Dermatologist
Navi Mumbai, Maharashtra, India

Savita Yadav MD
Assistant Professor
Department of Dermatology and Venereology
All India Institutes of Medical Sciences
New Delhi, India

Savitha AS MD
Assistant Professor
Department of Dermatology
Sapthagiri Institute of Medical Sciences
Bengaluru, Karnataka, India

Sharad Mutalik DVD
Consultant Dermatologist
Cutaneous and Laser Surgeon
Maharashtra Medical Foundation
Pune, Maharashtra, India

S Sacchidanand MD DVD DHA FRCP (Glasgow)
Director of Medical Education
Government of Karnataka
Dean cum Director
Department of Health and Education
Bangalore Medical College and Research Center
Bengaluru, Karnataka, India

Salim T MD
Medical Director and Clinical Head
Cutis Institute
Kozhikode, Kerala, India

Shehnaz Arsiwala MD DDV
Renewderm Centre, Saifee Hospital and
Prince Aly Khan Hospital
Mumbai, Maharashtra, India

Shekhar Neema MD
Assistant Professor
Department of Dermatology
Command Hospital
Kolkata, West Bengal, India

Shilpa K MD FRGUHS (Dermatosurgery)
Assistant Professor
Bangalore Medical College and Research Institute
Bengaluru, Karnataka, India

Shruthi C MD
Department of Dermatosurgery
Bangalore Medical College and
Research Institute
Bengaluru, Karnataka, India

Shyamanta Barua MD
Assistant Professor
Department of Dermatology
Assam Medical College and Hospital
Dibrugarh, Assam, India

Somesh Gupta MD
Additional Professor
Department of Dermatology
All India Institutes of Medical Sciences
New Delhi, India

Soumya Jagadeesan MD
Associate Professor
Department of Dermatology
Amrita Institute of Medical Sciences
Kochi, Kerala, India

Sujala S Aradhya MD (DVL) FRGUHS (Dermatosurgery)
Consultant Dermatologist and Dermatosurgery
Sujala Polyclinic and Laboratory
Bengaluru, Karnataka, India

Sukesh Mathapathi MS MD DNB FIADVL
Consultant Dermatotrichologist
People Tree - CITI - Fortis Hospitals
Bengaluru, Karnataka, India

Suman Patra MD
Senior Resident
All India Institutes of Medical Sciences
New Delhi, India

Surajit Gorai MD DNB MNAMS
Consultant Dermatologist
Apollo Gleneagles Hospitals
Kolkata, West Bengal, India

Sushil Tahiliani MD DV&D
Hinduja Hospital and Research Center
Bharatiya Arogya Nidhi Hospital
Asian Heart Institute
Mumbai, Maharashtra, India

Sushmitha Jayaprasad
MD FRGUHS (Aesthetic Dermatology)
Junior Consultant
Cutis Academy of Cutaneous Sciences
Bengaluru, Karnataka, India

Swapnil Shah MD
Associate Professor
Ashwini Rural Medical College
Solapur, Maharashtra, India

Syed Mubashir MD FRGUHS (Dermatosurgery)
Department of Dermatology
Government Medical College
Srinagar, Jammu and Kashmir, India

Teena Ramesh MD FRUGHS (Aesthetic Dermatology)
Consultant
Cutis Academy of Cutaneous Sciences
Bengaluru, Karnataka, India

Tolong K MD
Consultant Dermatologist
Shija Hospitals and Research Institute
Imphal, Manipur, India

Umashankar Nagaraju MD
Professor
Rajarajeshwari Medical College and Hospital
Bengaluru, Karnataka, India

Vaishalee Kirane DVD DNB
Dermatologist and Trichologist
Ruby Hall Clinic
Aditya Birla Memorial Hospital and
Joshi Hospital
Pune, Maharashtra, India

Vandana Chatrath MD
Dermatologist and Dermatological Surgeon
Delhi Dermatology Group
New Delhi, India

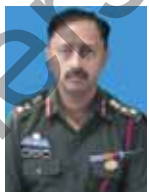
Varsha DV DVD FRGUHS Dermatosurgery (Madrid)
Consultant Dermatologist
BOSS Hospital
Bengaluru, Karnataka, India

Venkataram Mysore
MD DNB DipRC Path (LOND) FRCP (GLASGOW) FISHRS
Venkat Charmalaya, Bengaluru, Karnataka, India

Vinay Saraf MD DVD
Senior Consulting Dermatologist
Nanavati Superspeciality Hospital
Mumbai Skin and Laser Clinic
Mumbai, Maharashtra, India

Message

Message from President of ACS(I)



The step by step book to Dermatosurgical Procedures, a proposal of the fledgling Association of Cutaneous Surgeons (India)[ACS(I)] Academy as it gains wings, has been a project close to my heart as ACS(I) President as well as to all members of the ACS(I) executive. At the ACS(I), it has been our endeavor to throw open our gates to a more universal acceptance of dermatosurgery as a potent therapeutic tool in the hands of the dermatologist. We have tried to ensure that the skill and practice of dermatosurgery are acquired by those at the furthest reaches of our great nation. Toward this end, this book is meant to act as the carrier of the knowledge of basic and advanced skill in this growing branch of dermatology to every corner of our country. Being as it is a developing field, new skills and specialists are being added to the expanding fold of the specialty. This book will address the needs of those who join the dermatosurgery bandwagon.

This being a first-time effort, there are improvements that would be needed as we go along. I am sure that future editions would improve on this concept that the editors have so lucidly espoused in the form of this book. Being a sister text of our highly successful Textbook of Dermatosurgery, it would be a worthy companion next to the operating table for those of us who need to be in constant touch with a quick guide as we perform the procedures that characterize our branch.

I wish this effort the very best and am sure of its acceptance by the rank and file of dermatosurgeons in India and abroad.

Jai Hind

Dr (Col) Manas Chatterjee MD
President, ACS(I), 2015–17
Professor and Head
Department of Dermatology
INHS Asvini
Mumbai, Maharashtra, India

Foreword

It is indeed a privilege for me to write this foreword for a singularly unique endeavor of the Association of Cutaneous Surgeons (India) which has been executed with great aplomb by Dr (Lt Col) Biju Vasudevan and his team. This illustrated step by step book to the performance of various procedures would be a welcome addition to the desk of the budding dermatosurgeon who is all set to explore the world of procedural dermatology.

Dermatosurgery has gained a strong foothold in the practice of dermatology with procedural management being required by almost a third of all patients being seen in our OPDs and clinics. There is a felt need for a book that succinctly details the steps of the various procedures without going into details of the theoretical basis of these therapeutic modalities. This would enable an enthusiast to start with the procedures, get the desired results which would enhance his interest in the details of these modalities. It is in this niche that this book would find a place in the young practitioner's mindset. In addition, established seniors, sometimes need to revisit what they have been doing to enhance their skills and find new ways of enhancing their outcomes.

The step by step book is embellished with images detailing the key steps of the various procedures which would make it easier for the dermatosurgeon to understand and emulate the said steps and thus would increase his confidence in these mostly simple but effective modalities of surgical dermatotherapeutics. The short descriptions are meant to enhance understanding without it being an encroachment on the limited time available when the dermatosurgeon is just about to embark on a procedure. In this respect, this short companion is meant to be on the side of the specialist in his hour of need.

It is hereby hoped that this short treatise be a stepping stone to betterment of dermatosurgical care of our patients.

Dr (Col) Manas Chatterjee MD
President, ACS(I), 2015–17
Professor and Head
Department of Dermatology
INHS Asvini
Mumbai, Maharashtra, India

Preface

This book *Procedural Dermatosurgery: A Step by Step Approach* is a dream project of the Association of Cutaneous Surgeons (India)[ACS(I)] Academy and involves the description of various surgical procedures in a stepwise manner. It contains the detailed steps involved in doing various dermatosurgical procedures accompanied by figures for each of the steps. This would help all budding and practicing dermatosurgeons to easily carry out these procedures just by reading and having a visual outlook of the respective surgeries.

The chapters are contributed by eminent dermatosurgeons who are experts in their respective fields from all over the country. The book will be a ready reference for dermatologists, dermatosurgeons, dermatology residents and will also be a guide for other specialties when they encounter a dermatosurgery case.

Tips and tricks, modifications, complications and recent advances are highlighted for each procedure. The chapters are concise and have been made crisper by addition of tables, flowcharts and algorithms.

We are sure this book will be a welcome addition to all concerned.

Regards

Biju Vasudevan
Manas Chatterjee
Shilpa K

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We are very thankful to all faculty and residents of Bangalore Medical College, Bengaluru, Karnataka, India.

Contents

CHAPTER 2

Local Anesthesia for Dermatosurgical Procedures

Sushil Tahiliani, Savitha AS

INTRODUCTION

Dermatologists routinely perform procedures, which may either be diagnostic or therapeutic. Most of these procedures are performed under local anesthesia in an outpatient setting. According to workforce guideline: "Office-based dermatologic surgery is defined as surgery performed by a licensed physician to diagnose and treat certain skin conditions using topical, local, infiltrative, or tumescent anesthesia in an office or facility outside of ambulatory surgical centers and hospital settings."[1] As most of the procedures performed are elective procedures, the overall comfort of the patient is also important.

ANESTHETIC AGENTS

The structure of local anesthetics can be divided into three distinct parts: an aromatic portion (lipophilic), intermediate chain (composed of either ester or amide linkage), and amine group (hydrophilic). This is the basis of local anesthetic classification as either esters or amides. Ester anesthetics are metabolized via the plasma enzyme and pseudocholinesterase. Hydrolysis is rapid and the by-products are excreted in the urine. Amide anesthetics are metabolized primarily by the liver. They should be used with caution in patients with liver disease (Table 2.1).

COMBINATION OF LOCAL ANESTHETICS WITH ADRENALINE

This combination offers following advantages:

- Decreases anesthetic absorption and systemic toxicity with improved efficacy; thus smaller amounts required.
- Prolonged duration of action (almost doubled); especially with lignocaine and procaine.
- Less bleeding at operative site; especially useful on vascular areas with better visualization of operative field.

Adrenaline may potentially induce adverse effects. Therefore, its use must be carefully considered in patients with heart disease and those patients concomitantly taking β-blockers.

DIFFERENT TYPES OF ADMINISTRATION OF LOCAL ANESTHESIA

- Surface anesthesia
- Infiltrative anesthesia
- Tumescent anesthesia
- Nerve blocks

Topical Anesthesia/Surface Anesthesia

Topical anesthesia causes superficial loss of pain sensation after direct application of local anesthetic solutions,

Table 2.1: Pharmacological properties of commonly used local anesthetics.

Agent	*Procaine*	*Prilocaine*	*Lidocaine*	*Bupivacaine*
Onset of action (min)	2–5	>2	<2	5
Duration of action (min)	20–30	30–90	30–60	120–240
Duration of action with adrenaline	30–45	120	120	180–240
Elimination half life (hrs)	0.66	1.5	1.6	3.5
Max dose	500 mg or 7 mg/kg	350 mg	300 mg 4.5 mg/kg	175 mg or 2 mg/kg
Max dose with adrenaline	600 mg	550 mg	500 mg or 7 mg/kg	200 mg

ointments, gels or sprays. They reversibly block nerve conduction near their site of administration by targeting free nerve endings in the dermis or mucosa, thereby producing temporary loss of sensation in a limited area.

Factors Affecting the Action of Topical Anesthesia[2]

- *Drug form*: Free bases are lipophilic and can penetrate the stratum corneum on their own, whereas the salt forms require special delivery systems to do so.
- *Melting point and eutectic mixtures*: The lower the melting point, the better the penetration is. Eutectic mixtures have a lower melting point, thus better penetration than either component by itself.
- *Concentration of drug in vehicle*: Higher the concentration of drug in the vehicle, higher the rate of penetration.

Skin Permeation Enhancers

These compounds, promote skin permeability by increasing the permeability of the stratum corneum temporarily and reversibly. They can be:

- Solvents, e.g. water, alcohols, glycerol, low molecular weight ethers, sucrose esters, silicone fluids, etc.
- Surfactants, e.g. ionic and nonionic bile salts
- Miscellaneous chemicals, e.g. urea, anticholinergic drugs.

Physical Means of Enhancing Permeation

Skin penetration of topically applied anesthetics can be enhanced by following physical measures:

- Exfoliation of the skin.
- Degreasing by alcohol.
- By covering the application area with a dressing or patch of nonporous material such as micropore and tegaderm.
- *Iontophoresis*: Lignocaine HCl 10%/adrenaline 0.1% topical iontophoretic patch (LidoSite) is the first Food and Drug Administration (FDA) approved prefilled active anesthetic patch.

  Disadvantages of iontophoresis technique are:
  - Can cause skin irritation at higher current densities or upon longer application.[3]
  - Prolonged application can also cause electrochemical polarization in the skin, which decreases the magnitude of current flow through the skin.

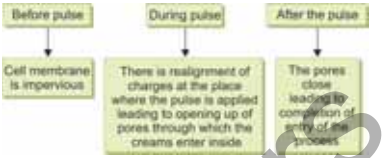


Fig. 2.1: Schematic diagram of electroporation.

  - The mild electrical sensation can be uncomfortable for some patients.
  - It cannot be used over large surface areas of the body.
- Electroporation (uses short electrical impulses of high voltage to create transient pores in the skin) (Fig. 2.1).[4]
- Sonophoresis or phonophoresis (low frequency, ultrasonic energy to disrupt stratum corneum): The ultrasound enhances drug delivery by cavitation, micro steaming and heating (Fig. 2.2).
- Magnetophoresis/magnetokinesis (application of magnetic field to enhance permeation).[5]
- Thermal energy (heat increases skin permeability).
- Erbium:YAG laser pretreatment.[6] Reapplication of topical anesthetic after first pass of ablative lasers produces quicker and deeper anesthesia.
- Skin pretreatment with a hand-applied, plastic microneedle array.[7]

Eutectic Mixture of Local Anesthetics

Eutectic mixtures are compounds, which melt at lower temperatures than any of their components, permitting higher concentrations of anesthetics for use. It is 5% oil in water emulsion cream with a melting point of 18°C and consists of 25 mg/mL of lignocaine, 25 mg/mL of prilocaine, a thickener, an emulsifier, and distilled water adjusted to a pH level of 9.4. EMLA can be used safely on mucosa also.

Commonly Used Method of Application

Topical anesthesia is applied in a thick layer (1–2 g/10 cm^2, up to a maximal dose of 20 g/200 cm^2) to intact skin. After application, the area is covered with a patch of tegaderm or clear plastic wrap to facilitate penetration through the stratum corneum (Fig. 2.3). Depth of anesthesia depends on the contact time with Eutectic Mixture of Local Anesthetics (EMLA).

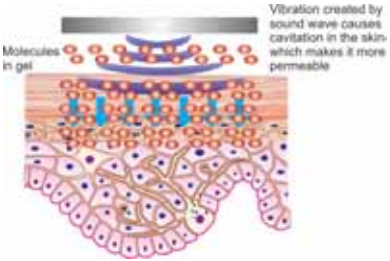


Fig. 2.2: Schematic diagram of sonophoresis.

Anesthetic effect has been shown to reach a maximal depth of 3 mm after a 60-min application, and 5 mm after a 120-min application. Dermal analgesia can be expected to increase for up to 3 hours under occlusive dressing and persist for 1–2 hours after removal of the cream. Eutectic mixture of local anesthetics are not reliably effective on the palms and soles because of variable penetration.[2]

Advantages of Topical Anesthesia

- Painless as compared to infiltrative anesthesia
- Safely used in patients with needle anxiety
- No tissue edema which can distort surgical site.

Disadvantages of Topical Anesthesia

- Expensive
- Onset time: 30–45 minutes
- Allergic reactions in sensitive patients
- EMLA is a pregnancy category B agent, should be used cautiously in nursing mother, because lignocaine is excreted through breast milk
- With 60 minutes application, the depth of anesthesia obtained is only 3 mm. More invasive procedures are less tolerable under topical anesthesia.

Indications of Topical Anesthesia

- Nonablative laser treatments
- Skin biopsy, Botulinum toxin and filler injections
- To lessen the pain of infiltrative anesthesia
- Pregnant women and nursing women.

Fig. 2.3: Topical anesthesia applied under occlusion.

Fig. 2.4: Marking the borders of the lesion prior to infiltration.

Infiltrative Anesthesia

This is the most commonly used technique of anesthesia. Here the anesthetic agent is directly injected into the site of lesion either intradermally or subcutaneously. 1% lignocaine is the most commonly used anesthetic agent.

***Tip*:** Direct infiltration to the surgical site causes distortion of landmarks, so marking the area is important prior to infiltration (Fig. 2.4).

Procedure (Fig. 2.5)

- Skin is held taut.
- Bevel of the needle inserted, preferably into follicular opening as this reduces the pain.
- Infiltrate the area adequately at the level of deep dermis.
- Appearance of peau d' orange indicates the level is in upper dermis, which causes discomfort to the patient (Fig. 2.6).

Fig. 2.5: Direct infiltration of anesthesia beneath the lesion.

Fig. 2.6: Peau d' orange when infiltration is in upper dermis.

- Additional needle pricks when required are to be placed in previously anesthetized adjacent areas and then proceed to nonanesthetized area to reduce the pain due to needle prick (refer to images of ring block).

Ring Block/field Block (Figs. 2.7A to E)

Ring block is a type of infiltration anesthesia. The anesthetic agent is infiltrated circumferentially around the surgical site, without direct injection in the operative field.

A ring block is useful when the distortion of a surgical site due to the infiltration of anesthesia is not desired. Injection should be into both superficial and deep planes to be effective.[8]

Advantages: Ring blocks allow a decreased volume of anesthetic to be used to anesthetize a larger area.

Steps: Steps for ring block/field block are shown in Figures 2.7A to E.

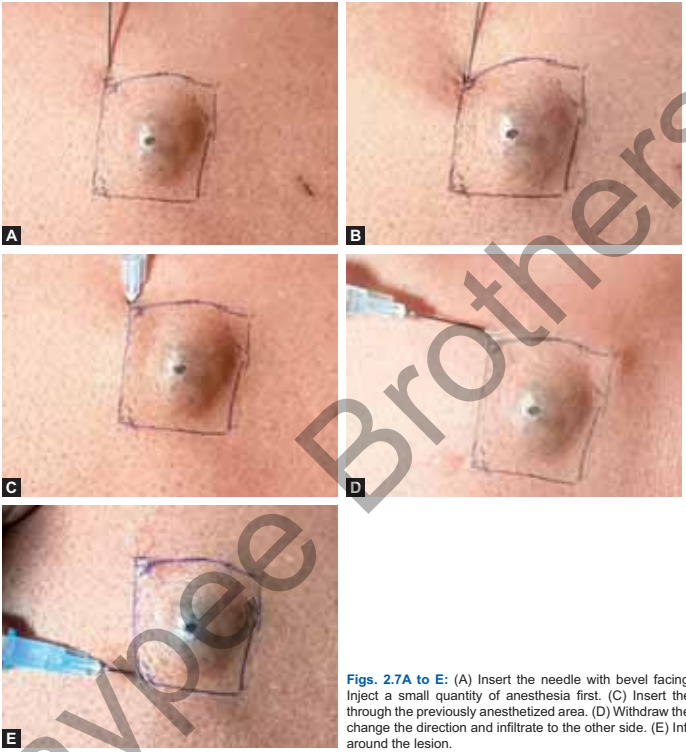
Needleless Dermajet

This is a needleless pressure injection syringe, used for the intradermal infiltration of drugs in a soluble state. This technique achieves almost painless tissue infiltration with a high velocity microspray in single or multiple doses of 0.1 cc to a depth of 2 to 5 mm, without actual contact with the site of injection. A fine jet emitted under great pressure punctures the tissue without scoring, with a minimum amount of trauma, raising instantaneously a well-defined pinpoint wheal (Figs. 2.8A to D).[9]

Tumescent Anesthesia[10]

This term is used to describe injection of high volume, low concentration lidocaine/epinephrine solution used by dermatologic surgeons for liposuction, hair transplantation, laser resurfacing, flaps and grafts, etc. The solution provides anesthesia safely, is practically painless to inject, and markedly decreases bleeding. Epinephrine (1:1,000,000) is added for hemostasis, and the solution is buffered with sodium bicarbonate to decrease injection discomfort. Concentrations as high as 55 mg/kg have been used safely with the tumescent technique. The absorption kinetics of lidocaine change when high-volume, low-concentration solutions are used. Decreased concentrations of lidocaine also result in slower plasma absorption with decreased peak plasma levels.[8] The tumescent technique for local anesthesia permits regional local anesthesia of the skin and subcutaneous tissues by using direct infiltration rather than a proximal nerve block. By using large volumes of a dilute anesthetic solution consisting of lidocaine (0.1% or 0.05%) and epinephrine (1:1,000,000) in physiologic saline, the tumescent technique produces swelling and firmness, or tumescence, of targeted fatty areas. Recent clinical studies of the absorption pharmacokinetics of lidocaine with the tumescent technique have shown that peak plasma lidocaine levels occur approximately 12 to 15 hours after beginning the infiltration.

Clinical local anesthesia persists for up to 18 hours, obviating the need for postoperative analgesia.



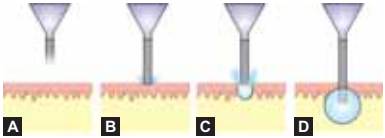
Figs. 2.7A to E: (A) Insert the needle with bevel facing up. (B) Inject a small quantity of anesthesia first. (C) Insert the needle through the previously anesthetized area. (D) Withdraw the needle, change the direction and infiltrate to the other side. (E) Infiltrate all around the lesion.

Complications of Infiltrative and Tumescent Anesthesia

Local: The local effects are summarized in Table 2.2.

Systemic effects[11]: Systemic effects are most often encountered after the unintentional intravenous injection or administration of an excessive dose of an anesthetic. Adding a vasoconstrictor (e.g. epinephrine) can reduce the systemic absorption of an anesthetic. When using topical anesthetics, strict adherence to the maximal dose and area recommended is advised. Great caution must be exercised when using topical anesthetics on mucosal surfaces because of the much greater absorption. Allergic reactions, although systemic, are not related to serum levels of the anesthetic, but rather, they are considered idiosyncratic and can occur at any dose.

Maximum safe doses of lidocaine, and lidocaine with epinephrine is 4.5 mg/kg body weight and 7 mg/kg respectively. The CNS is affected in a predictable and dose-dependent fashion. As serum levels of lidocaine increase,



Figs. 2.8A to D: (A) A fine jet is emitted from the nozzle at high velocity (> 100 m per second). (B and C) Impact of the jet on the skin surface punctures the tissue. (D) As the hole in the skin becomes deeper, the liquid that has accumulated in the hole slows down the incoming jet, and the progression of the hole in the skin is stopped.

effects on the CNS become more severe. At serum lidocaine levels in the range of 1–5 μg/mL, patients may complain of tinnitus, light headedness, circumoral numbness, diplopia, or a metallic taste in the mouth. In addition, they may complain of nausea and/or vomiting, or they may become more talkative. As serum levels increase to 5–8 μg/mL, nystagmus, slurred speech, localized muscle twitching, or fine tremors may be noticed. Patients also have been noted to have hallucinations at these levels. If blood lidocaine levels reach 8–12 μg/mL, focal seizure activity occurs; this can progress to generalized tonic-clonic seizures. Respiratory depression occurs at extremely high blood levels (20–25 μg/mL) and can progress to coma. If signs of CNS toxicity are noted, steps must be taken to reduce hypoxia and acidosis, because these states increase the toxicity of local anesthetics. The patient's airway should be maintained, and supplemental oxygen provided. If blood levels of carbon dioxide increase, protein binding of lidocaine decreases and this results in higher levels of free lidocaine in the blood. Increased respiration and respiratory alkalosis increase the seizure threshold and decrease the uptake of the local anesthetic into the CNS.

Compared with the CNS, the cardiovascular system is less susceptible to the effects of local anesthetics. Most adverse effects of the cardiovascular system that occur with the administration of local anesthetics are a result of the addition of epinephrine rather than direct effects of the anesthetic. However, high blood levels of local anesthetics directly reduce cardiac contractility. In addition to the direct vasodilatory effects of most local anesthetics, the decrease in cardiac function can cause hypotension. Atrioventricular blocks, bradycardia, and ventricular arrhythmias also are reported; these are more common in patients with known conduction disturbances and those requiring antiarrhythmic medications.

Table 2.2: Local effects.

Complications	*Cause*	*Prevention and treatment*
Pain	• Due to needle puncture of the skin • Acidic pH 3.5-4.5 due to epinephrine • Tissue irritation from the anesthetic • Distention of tissues	• Slow administration • Add sodium bicarbonate
Ecchymosis	• Perforation of cutaneous blood vessels (Common in mucous membranes, head, and genitalia) • Patient has a bleeding diathesis • Aspirin or other anticoagulants like green tea, vitamin C, vitamin E, gingko biloba	• Reassurance. Will disappear over time. The fresh hematoma may require drainage with an 18-gauge needle, followed by the application of a pressure dressing.
Infection	• Proper sterile technique is not used	• Use proper sterile techniques

Allergic reactions: Allergic reactions to local anesthetics are extremely rare, especially with amide local anesthetics, and account for less than 1% of the reactions caused by local anesthetics. Reactions can be type I (i.e. anaphylactic) or type IV (i.e. delayed-type hypersensitivity) reactions. These reactions are idiosyncratic and not dose dependent. Skin prick and intradermal test results are negative in the vast majority of patients, but some authors recommend testing with the most commonly used amide local anesthetic (lidocaine). Clinical signs of type I reactions include pruritus, urticaria, facial swelling, wheezing, dyspnea, cyanosis, laryngeal edema, nausea, vomiting, and abdominal cramping. Epinephrine with a concentration of 1:1000 should be administered subcutaneously in a dose of 0.3–0.5 mL. This dose can be repeated every 20–30 minutes to a maximum of 3 doses. If anaphylaxis ensues, a 5 mL dose of epinephrine 1:10,000 should be administered intravenously. Type IV (i.e. delayed-type hypersensitivity) reactions account for 80% of allergic reactions to local anesthetics. They are more common with the use of topical anesthetics and may occur with anesthetics of both amide and ester subtypes. Clinical manifestations are similar to those of allergic contact dermatitis and include erythema, plaques, and pruritus. Patients with a history of type IV reactions are not at an increased risk of type I reactions due to amide type anesthetics. Contact dermatitis caused by topical anesthetics should be treated with topical steroid preparations.

Nerve Blocks

A nerve block involves placing the local anesthetic solution in a specific location at or around the main nerve trunk that will effectively depolarize that nerve and obtund sensation in the area of sensory distribution of that particular nerve.

Advantages

Single accurately placed injection can obtund large areas of sensation without tissue distortion at operative site.

Disadvantages

- Sensation of numbness in areas other than the operative site
- Lack of hemostasis at the operative site due to lack of vasoconstrictor component of the local anesthetic injection, which is obtained in injection form at site directly.

Since many nerves are accompanied by corresponding veins and arteries, preinjection aspiration should always be performed to prevent intravascular injection.

Commonly Used Nerve Blocks

Supraorbital nerve block (Figs. 2.9A to D): Supraorbital nerve exits the supraorbital foramen, and divides into medial and lateral branches, each branch accompanied by its artery.

Supratrochlear nerve block (Figs. 2.10A and B): The supratrochlear nerve block is often performed in

Figs. 2.9A to D: (A) Supraorbital and supratrochlear nerve and areas supplied by them. (B) The supraorbital foramen is located with the pulp of the index finger of nondominant hand along the supraorbital ridge until a subtle notch is felt. (C) Another method is to place three fingers centered vertically over glabella, the major branches of supraorbital nerve emerge just lateral to the fingers. (D) Insert the needle just lateral to the foramen, it will seek the bone contact (with less than 10 mm generally) at the edge of the foramen. Inject very slowly 1.5–2 mL of anesthetic solution with the needle facing medially.

Figs. 2.10A and B: Supratrochlear nerve block: Insertion is on the supraorbital ridge approximately 1 cm medial to the supraorbital notch between the notch and the bridge of the nose.

conjunction with the supraorbital nerve block to achieve regional anesthesia over the ipsilateral forehead.

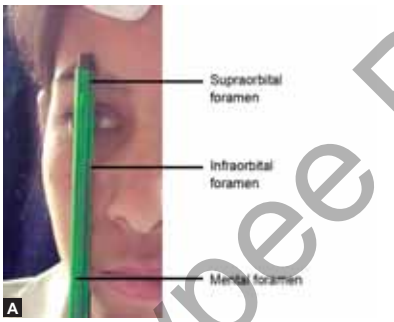
Infraorbital nerve block (Figs. 2.11A to C): The infraorbital nerve leaves by the infraorbital foramen located at 4–7 mm below the infraorbital bone edge.

Extraoral technique: The extraoral technique of infraorbital nerve block is shown in Figures 2.11A and B.

Endo-oral method: The endo-oral method of infraorbital nerve block is shown in Figure 2.11C.

Mental nerve (Figs. 2.12A and B): The mental nerve is the terminal branch of the inferior alveolar nerve. It enters the face through the mental foramen and supplies the inferior lip and the chin.

1. *Intraoral approach (Fig. 2.12A)*
2. *Transcutaneous route (Fig. 2.12B)*



Figs. 2.11A to C: (A) To locate the infraorbital foramen, the patient is asked to look straight ahead and imagine a line drawn vertically from the pupil down to the superior border of the infraorbital ridge. Then palpate along the ridge until a subtle notch is felt; this is the infraorbital notch. The infraorbital foramen is located about 4–7 mm below this notch. (B) The needle should be directed cephalic and medially and inject 1.5 to 2 mL of anesthetic after withdrawing. (C) Palpate infraorbital foramen and insert needle between incisor and first premolar into buccal recess.

Figs. 2.12A and B: (A) The mental foramen is palpable between the 2 lower premolar teeth. Insert the needle along the lower gum line into the buccal fold between the premolar teeth near the foramen. (B) Insert needle at mental foramen, advance needle perpendicular to bone until periosteum is reached, withdraw the needle and inject 2–3 mL of anesthetic near the mental foramen, but not straight into it.

Figs. 2.13A and B: Greater occipital nerve block. Place three fingers on superior nuchal line with middle finger on the external occipital protuberance, point of injection is just lateral to the lateral fingers on either side.

Greater occipital nerve block: The greater occipital nerve block is shown in Figures 2.13A and B

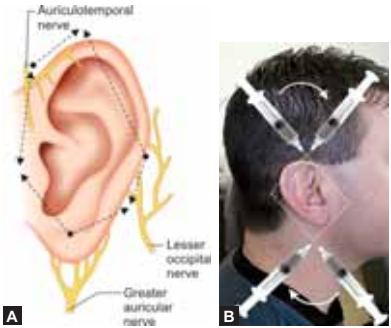
Greater auricular nerve block (Figs. 2.14A and B): The greater auricular nerve numbs the lower third of the ear and the lower postauricular skin. Locate the mastoid tip and inject local anesthetic both anterior and posterior to the mastoid.

Digital nerve blocks (Figs. 2.15A to C): Each digit is innervated by 4 digital nerves. The 2 palmar digital nerves innervate the palmar aspect of the digit and the nail bed, whereas the dorsal nerves innervate the dorsum of the digit.

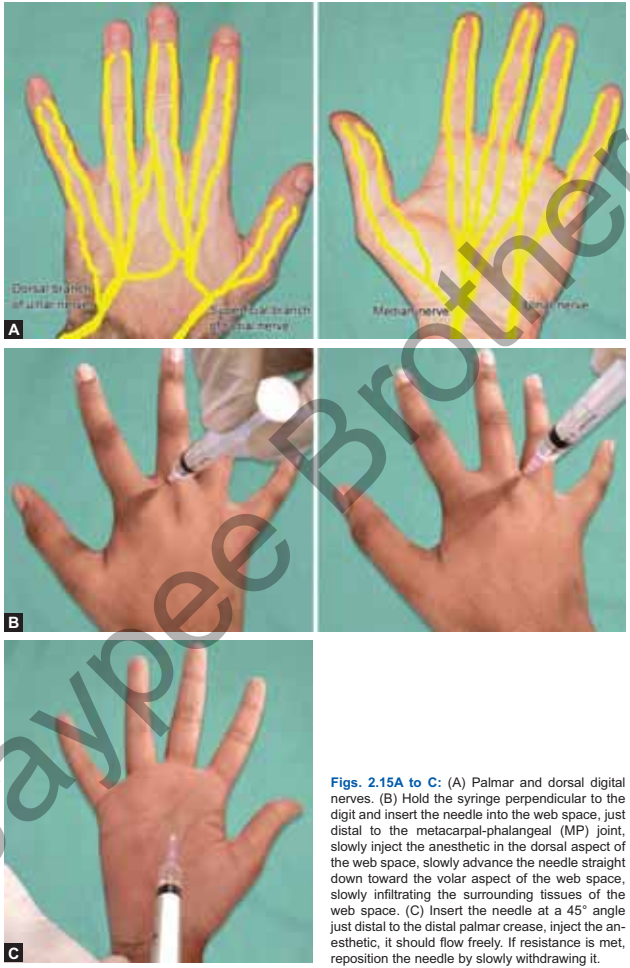
a. *Proximal digital nerve block* (Fig. 2.15B)
b. *Transthecal block (Fig. 2.15C)*

Distal Digital Block (Wing Block)[12]

The procedure for distal digital block is shown in Figures 2.16A to C.



Figs. 2.14A and B: Greater auricular nerve block.



Figs. 2.15A to C: (A) Palmar and dorsal digital nerves. (B) Hold the syringe perpendicular to the digit and insert the needle into the web space, just distal to the metacarpal-phalangeal (MP) joint, slowly inject the anesthetic in the dorsal aspect of the web space, slowly advance the needle straight down toward the volar aspect of the web space, slowly infiltrating the surrounding tissues of the web space. (C) Insert the needle at a 45° angle just distal to the distal palmar crease, inject the anesthetic, it should flow freely. If resistance is met, reposition the needle by slowly withdrawing it.

Figs. 2.16A to C: (A) Needle is inserted 2–3 mm proximal to the junction of proximal and lateral nail fold. Insert the needle vertically and advance towards ventral aspect, inject about 0.5 to 1 mL of anesthetic agent. (B) Three types of distal digital blocks with areas covered (C1) Insert the needle at a 90° angle at the medial aspect of the digit, just distal to the metatarsal-phalangeal joint. (C2) Slowly inject the anesthetic as the needle is advanced toward the volar/plantar side, without piercing the volar skin. (C3) Make another injection over the already anesthetized skin at the lateral aspect of the digit, with the needle at 90°, advancing it from the dorsal to ventral aspect, as was done medially.

Three-sided digital block: Figure 2.16C shows the three-sided distal digital block technique.

TIPS FOR REDUCING PAIN DURING ANESTHESIA

- Topical anesthesia prior to needle puncture
- Smaller size needles, 30 gauge needles
- Injection through cutaneous pores
- Slow infiltration; infiltrate as one advances the needle slowly.
- Distraction: Massage or vibration; an assistant who "hand holds" and chats with the patient.
- Buffered lidocaine with sodium bicarbonate and freshly mixed epinephrine.
- Re-inject in anesthetized areas; minimize sticks.

- Reducing the temperature of the area to be injected using ice packs, cold air or any contact cooling devices reduces the pain.
- Application of vibration during infiltration is known to reduce the pain based on gate control theory.

AVOID

- Hurried behavior
- Sudden needle stabs
- Rapid infiltration as tissue distension causes pain
- Injection of plantar/palmar surfaces (use blocks and lateral approaches)
- Avoid hitting bone with the needle.

CONCLUSION

Painful experience is an unforgettable aspect for the patient during any procedure. If one can provide a nearly painless procedure with proper local anesthesia for aesthetic procedures, then half the battle is won.

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