ACS(I)

Textbook of

CUTANEOUS AND

AESTHETIC SURGERY

Under the Aegis of Association of Cutaneous Surgeons (I)
ACS(I)

Textbook of
CUTANEOUS AND AESTHETIC SURGERY

Volume 1

Second Edition

Editor-in-Chief

Mysore Venkataram DVD MD DNB DipRCPath (Lond) FRCP (Glasgow) FISHRS
Consultant: Dermatologist-Dermatopathologist-Hair Transplant Surgeon
Director: Venkat Charmalaya-Centre for Advanced Dermatology and Postgraduate Teaching Centre
Bengaluru, Karnataka, India
Treasurer: Dermatologists and Aesthetic Surgeons League (DASIL)
Editor-in-Chief of Journal of Cutaneous and Aesthetic Surgery, 2007-2010
President of Indian Association of Dermatologists, Venereologists and Leprologists, 2015
President of Association of Hair Restoration Surgeons, India, 2013
President of Association of Cutaneous Surgeons of India, 2010-2013
Deputy Editors

Ankur Talwar MD
Consultant Dermatologist
Talwar Skin Institute
Lucknow, Uttar Pradesh, India
E-mail: docankurtalwar@gmail.com

M Kumaresan MD
Assistant Professor
Department of Dermatology
PSG Hospitals
Coimbatore, Tamil Nadu, India
E-mail: dr_kumaresh@yahoo.co.in

Madhulika Mhatre MD FRG UHS (Medical Cosmetology)
Consultant Dermatologist
Wockhardt Hospitals, Mulekar Vitiligo Clinic
Mumbai, Maharashtra, India

Subodh Jane MD FRG UHS
Amravati, Maharashtra, India

Shashikumar BM DVL FIADVL (Dermatopathology)
Associate Professor
Department of Dermatology
Venereology and Leprosy
Mandya Institute of Medical Sciences
Mandya, Karnataka, India

Savitha AS MD DNB FRG UHS
Assistant Professor
Department of Dermatology
Sathagiri Institute of Medical Sciences and Research Institute
Bengaluru, Karnataka, India

Assistant Editors

Eswari L MBBS MD DVL FRG UHS (Dermatosurgery)
Bengaluru, Karnataka, India

Amee Ben Patel DDVL FRG UHS
Fellowship Trainee
Venkat Charmalaya, Centre for Advanced Dermatology
Bengaluru, Karnataka, India
E-mail: ameepatel1990@yahoo.co.in

Prangya Parimita Rana
Fellowship Trainee
Venkat Charmalaya
Centre for Advanced Dermatology
Bengaluru, Karnataka, India

Vani Yeperi
Consultant Dermatologist
Venkat Charmalaya
Centre for Advanced Dermatology
Bengaluru, Karnataka, India

Madura C MD FRG UHS (Derm Surg)
Consultant Dermatologist and Dermatosurgeon, Cutis Academy
Bengaluru, Karnataka, India

Priyadarshini P Gaddagimath DDVI FRG UHS (Pediatric Dermatology)
Consultant Dermatologist
Venkat Charmalaya, Centre for Advanced Dermatology
Bengaluru, Karnataka, India

Sujala S Aradhya
Consultant Dermatologist and Dermatosurgeon
Sujala Polyclinic and Laboratory
Bengaluru, Karnataka, India

Sachin Dhawan MD DVD
Consultant Dermatologist
Skin-n-Smiles, Gurugram, Haryana, India

Nikita Patel DDVL
Consultant Dermatologist
Clear Skin Clinic
Thane, Maharashtra, India
E-mail: drnikitalodha@gmail.com

Aniketh Venkataram MBBS MS Mch (Plastic Surgery) FDAFPRS
Consultant Plastic, Aesthetic and Hair Transplant Surgeon
Venkat Charmalaya
Centre for Advanced Dermatology, Bengaluru, Karnataka, India
E-mail: anikethv@gmail.com
**Contributors**

- **Mysoor Venkataram** DVD MD DNB DipRCPath (Lond) FRCP (Glasgow) FISHRS  
  Consultant: Dermatologist-Dermatopathologist-Hair Transplant Surgeon  
  Director: Venkat Charimalaya-Centre for Advanced Dermatology and Postgraduate Teaching Centre, Bengaluru, Karnataka, India  
  Treasurer: Dermatologists and Aesthetic Surgeons League (DASIL)  
  Editor-in-Chief of Journal of Cutaneous and Aesthetic Surgery, 2007-2010  
  President of Indian Association of Dermatologists, Venereologists and Leprologists, 2015  
  President of Association of Hair Restoration Surgeons, India, 2013  
  President of Association of Cutaneous Surgeons of India, 2010–2013

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Institution</th>
<th>City, State, Country</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aarti Sarda</strong></td>
<td>Consultant Dermatologist, Wizderm Clinics</td>
<td>Kolkata, West Bengal, India</td>
<td></td>
</tr>
<tr>
<td><strong>Abdul Latheef EN</strong></td>
<td>MD DVD MSc APPLIED PSYCHOLOGY Associate Professor, Department of Dermatology Calicut Medical College Calicut, Kerala, India</td>
<td>E-mail: <a href="mailto:drlatheef.skin@yahoo.com">drlatheef.skin@yahoo.com</a>, <a href="mailto:drlatheef90@gmail.com">drlatheef90@gmail.com</a></td>
<td></td>
</tr>
<tr>
<td><strong>Abhishek DK</strong> De MD FAGE</td>
<td>Consultant Dermatologist Associate Professor, Calcutta National Medical College Kolkata, West Bengal, India</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ajay R Hariani</strong> MS MCh (Plastic Surgery)</td>
<td>Vastudhan Cosmetic and Laser Surgery BCJ Asha Parekh Hospital Mumbai, Maharashtra, India</td>
<td>E-mail: <a href="mailto:ajayhariani@gmail.com">ajayhariani@gmail.com</a></td>
<td></td>
</tr>
<tr>
<td><strong>Alka Goel</strong> MD DNB MNAMS</td>
<td>Ex-Assistant Professor, Department of Dermatology Chacha Nehru Bal Chikitsalya (Affiliated to Maulana Azad Medical College) New Delhi, India</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aman Dua</strong> MBBS MD (Dermatology)</td>
<td>Consultant Dermatologist Ludhiana, Punjab, India</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Amarendra Kumar</strong></td>
<td>Dermaclinix, E/13, Defence Colony Ring Road, New Delhi, India</td>
<td>E-mail: <a href="mailto:dfamrendra67@gmail.com">dfamrendra67@gmail.com</a></td>
<td></td>
</tr>
<tr>
<td><strong>Ankur Talwar</strong> MD (Dermatology)</td>
<td>Assistant Professor, Hind Institute of Medical Sciences, Lucknow Consultant Dermatologist, Talwar Skin Institute Lucknow, Uttar Pradesh, India</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aniketh Venkataram</strong> MBBS MS MCh (Plastic Surgery) FDFPRS</td>
<td>Consultant Plastic, Aesthetic and Hair Transplant Surgeon Venkat Charimalaya, Centre for Advanced Dermatology Bengaluru, Karnataka, India</td>
<td>E-mail: <a href="mailto:anikethv@gmail.com">anikethv@gmail.com</a></td>
<td></td>
</tr>
<tr>
<td><strong>Anil Abraham MD</strong></td>
<td>Professor and Head Department of Dermatology St John’s Medical College Hospital Bengaluru, Karnataka, India</td>
<td>E-mail: <a href="mailto:docanilabe@yahoo.co.in">docanilabe@yahoo.co.in</a></td>
<td></td>
</tr>
<tr>
<td><strong>Anil Ganjoo MD</strong></td>
<td>Sr. Consultant Dermatologist and Laser Surgeon Skinnovation Laser Klinik New Delhi, India</td>
<td>E-mail: <a href="mailto:drganjoo1965@yahoo.co.in">drganjoo1965@yahoo.co.in</a></td>
<td></td>
</tr>
<tr>
<td><strong>Anil Kumar Garg</strong> MS MCh</td>
<td>Diplomat of American Board of Hair Restoration Director, Rejuvenate Hair Transplant Centre Indore, Madhya Pradesh, India</td>
<td>E-mail: <a href="mailto:anilgarg61@yahoo.com">anilgarg61@yahoo.com</a></td>
<td></td>
</tr>
<tr>
<td><strong>Aniruddha Gulanikar</strong> DVD DNB</td>
<td>Associate Professor Department of Dermatology MGM Medical College Aurangabad, Maharashtra, India</td>
<td>E-mail: <a href="mailto:agulanikar@hotmail.com">agulanikar@hotmail.com</a></td>
<td></td>
</tr>
<tr>
<td><strong>Anjali Pal</strong> MD Dermatology</td>
<td>Consulting Dermatologist Dr Marwali’s Skin and Laser Centre Mumbai, Maharashtra, India</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anurag Tiwari</strong> DVD DNB</td>
<td>Director and Consultant Dermatologist Center for Skin Disease and Laser Treatment Bhopal, Madhya Pradesh, India</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aparatim Goel</strong> MD DNB</td>
<td>Director of Cutis Skin Studio Consultant Cosmetic Dermatologist and Laser Surgeon Goel’s Cutis Skin Mumbai, Maharashtra, India</td>
<td>E-mail: <a href="mailto:cutisgoel@gmail.com">cutisgoel@gmail.com</a></td>
<td></td>
</tr>
</tbody>
</table>
| **Archana Singal**   | Professor, Department of Skin and STD UCMS and GTB Hospital New Delhi, India |}
Arika Bansal MD  (Dermatology and Venereology)
Diplomate ABHRS (American Board of Hair Restoration Surgeons)
Director, Eugenix Skin and Hair Sciences
Gurugram, Haryana, India

Arjit Coondoo
Professor, Department of Dermatology
KPC Medical College and Hospital, Kolkata, West Bengal, India
E-mail: acoondoo@gmail.com

Balaji AP MD DVL
Consultant Dermatologist
Ganesh Nagar
Vellore, Tamil Nadu, India

Banani Choudhury MD DNB MNAMS
Jaslok Hospital and Research Center
Skin Secrets
Mumbai, Maharashtra, India
E-mail: malavikakohli@gmail.com

Behroze M Deputy MD
Clinical Assistant to Dr Satish Savant
Mumbai, Maharashtra, India

Bhanu Prakash MD DVM PGDMLE
Professor, Department of Dermatology
Vydgi Institute of Medical Sciences and Research Center
Whitefield, Bengaluru, Karnataka, India
E-mail: drbhunuprakash@rediffmail.com

Biju Vasudevan MD FRGJHS
Assistant Professor
Department of Dermatology
Command Hospital
Pune, Maharashtra, India
E-mail: biiju.deepa@rediffmail.com

BS Gill
Junior Resident
Department of Dermatology
Institute of Naval Medicine, INHS Asvini
Mumbai, Maharashtra, India

BS Shivaswamy MS
Professor and Head
Department of General Surgery
Bangalore Medical College and Research Institute
Bengaluru, Karnataka, India

Chaithra Shenoy MBB MD FRGJHS
Cutis Academy of Cutaneous Science
Bengaluru, Karnataka, India
E-mail: chaithra.shenoy@gmail.com

Chander Grover
Assistant Professor, Department of Skin and STD
UCMS and GTB Hospital
New Delhi, India

Chandrashekar BS MD DNB
Chief Dermatologist, Cutis Academy of Cutaneous Sciences
Bengaluru, Karnataka, India

CR Srinivas MD FRCP (Glas)
Professor and Head, Department of Dermatology
Venereology and Leprosy
PSG Institute of Medical Sciences and Researches
Coimbatore, Tamil Nadu, India

CSHANMUGA SEKAR MD
Associate Professor
Department of Dermatology
PSG Hospitals
Coimbatore, Tamil Nadu, India

Davinder Parsad MD
Professor, Department of Dermatology
PGIMER
Chandigarh, India

Dinesh Kumar
Consultant Dermatologist
Dr Dinesh Skin and Hair Clinic
Chennai, Tamil Nadu, India

Dhanashree Bhide MD
Associate Consultant
KEM Hospital
Pune, Maharashtra, India

Dhepe Niteen V MD PAAD Fellow ASDS AADSM EADV ISHRS IADVL ACSI
Medical Director
SkinCity, The Postgraduate Institute of Dermatology
1st Floor, Nucleus Mall, Church Road, Opp. Commissioner Office Camp, Pune, Maharashtra, India
E-mail: niteendhepe@skincityindia.com

Dilip Kachhawa MD
Associate Professor
Department of Dermatology
Dr SN Medical College
Jodhpur, Rajasthan, India

Dipali Rathod
Assistant Professor
Department of Naval Medicine, INHS Asvini
Mumbai, Maharashtra, India

Divya Gorur MD FRGJHS
Assistant Professor
Bangalore Medical College and Research Institute
Bengaluru, Karnataka, India

Ekta Romi
MBBS DDV FCPS
Associate Consultant Dermatologist
Department of Dermatology and Venereology, KEM Hospital
Pune, Maharashtra, India

Feroze Kalivadan MD DNB MNAMS
Assistant Professor
Dermatology Department
King Faisal University, Saudi Arabia
Associate Professor
Dermatology Department
Amrita Institute of Medical Sciences
Kochi, Kerala, India

Firas Al-Niami MSc MRCGP EBDS
Consultant Dermatologist
Guy’s Hospital
London, United Kingdom

GR Rai Pok
Junior Resident, Department of Dermatology
Institute of Naval Medicine, INHS Asvini
Mumbai, Maharashtra, India
HARSH S TAHILIANI MD
Consultant Dermatologist
Mumbai, Maharashtra, India
E-mail: drharshst@gmail.com

HARISH PRASAD DR MBBS MD (Dermatology) FRGHS
Dermatosurgery (BMCRI)
We acknowledge help of Dr Harish Prasad in Proof Reading four Chapters

HARVINDER SINGH MARWAH MD DVD DNB
Marwah’s Skin and Laser Centre
Mumbai, Maharashtra, India
E-mail: drmarwah@hotmail.com

IMRAN MAHDI MBBS MD
Consultant Dermatologist
Cutis Institute of Dermatology
Srinagar, Jammu and Kashmir, India

INDRASHIS PRADER MD
Sagar Dutta Hospital
Kolkata, West Bengal, India

JAIISHREE SHARAD DDV Fellow in Cosmetic Dermatology (Florida) Fellow in Dermatologic Laser Surgery (Bangkok)
Cosmetic Dermatologist
Skinfinite Aesthetic Skin and Laser Clinic
Navi Mumbai, Maharashtra, India
E-mail: jaiishree19@gmail.com

JAYASHREE VENKATARAM DGO MBCOG
Consultant Lipo suction Surgeon
Venkat Charnmala-Centre for Advanced Dermatology and Postgraduate Teaching Centre
Bengaluru, Karnataka, India
E-mail: jayashreesampada@gmail.com

JAYAKAR THOMAS MD DD PhD MNAMS FAAD FRCP
Professor and Head, Department of Dermatology
Sree Balaji Medical College, Chennai, Tamil Nadu, India
E-mail: jayakarthomas@gmail.com

JYOTI GUPTA MD (Dermatology)
Dermaclinix, New Delhi, India
E-mail: jkgarg12@gmail.com

KABIR SARDANA MD DNB MNAMS
Professor of Dermatology and STID
Dr Ram Manohar Lohia Hospital and Post Graduate Institute of Medical Education and Research
New Delhi, India

KC NISCHAL MD
Associate Professor, Department of Dermatology
Adichunchanagiri Institute of Medical Sciences
Bellur, Karnataka, India
E-mail: kc_nischal@yahoo.com

KANIKA SAHNI MD
Assistant Professor, Department of Dermatology
All India Institute of Medical Sciences
New Delhi, India
E-mail: kanika_sah@yahoo.co.in

KAVISH CHOUHAN MBBS MD
Consultant Dermatologist and Hair Transplant Surgeon
Director-Dermaclinix-the Complete Skin and Hair Solution Center
All India Institute of Medical Science, New Delhi, India

KAVYA M MD DVD
Assistant Professor
Department of Dermatology, Venereology and Leprosy
Mandya Institute of Medical Sciences
Mandya, Karnataka, India

KEERTHI VELUGOTLA
Consulting Dermatologist
MS Skin Center
Bengaluru, Karnataka, India

KH SATYANARAYANA RAO MD PGDMLE PGDHDM Dip. STD/HIV (Bangkok)
Consultant Dermatologist
Central Government Health Scheme Polyclinic
Bengaluru, Karnataka, India
E-mail: konanurrao@gmail.com

KOUSHIK LAHIRI DDVL
Consultant Dermatologist, Apollo Gleneagles Hospital
Rita Skin Foundation and WIZDERM Greenwood Nook
Kolkata, West Bengal, India
E-mail: dermakoushik@gmail.com

KSHAMA TALWAR
Consultant Dermatologist
Talwar Skin Institute
Lucknow, Uttar Pradesh, India
E-mail: kshama.talwar@gmail.com

KRISHAN MEHRA
Junior Resident
Department of Dermatology
Institute of Naval Medicine, INHS Asvini
Mumbai, Maharashtra, India

KRUPA SHANKAR DS MD DDVL
Academic Coordinator
Department of Dermatology
Manipal Hospital
Bengaluru, Karnataka, India
E-mail: dermakrupa@yahoo.com

KT ASHIQUE DDVL
Consultant Dermatologist
Al Shifa Hospital, Perinthalmanna
Malappuram, Kerala, India
E-mail: drashique@gmail.com

KULDEEP SAXENA MBBS DDV DAM (USA)
Cosmozone Hair Transplant Center
Gwalior, Madhya Pradesh, India

LAKSHYAJIT D DHAMI MS MCh (Plastic)
Professor of Aesthetic Surgery
Vasudhan Cosmetic and Laser Surgery
Hinduja and Nanavati Hospital
Mumbai, Maharashtra, India
E-mail: dhami@drdhami.com

MALAVIKA KOHLI MD DVD DNB
Consultant Dermatologist
Director, Skin Secrets, Mumbai
Jaslok Hospital and Research Centre
Breach Candy Hospital Trust, Mumbai, Maharashtra, India
M Kumaresan MD (Dermatology)
Diplomate in American Board of Hair Restoration Surgery
Professor, Dermatology, PSGMSR
Coimbatore, Tamil Nadu, India
E-mail: dr_kumaresh@yahoo.co.in

Manas Chatterjee MD DNB (Dermatology)
Senior Adviser, Professor and Head
Department of Dermatology
Institute of Naval Medicine, INHS Asvini
Mumbai, Maharashtra, India

Manjit Sandhu Tahiliani DVD
Consultant Dermatologist
Mumbai, Maharashtra, India
E-mail: manjitsandhu88@gmail.com

Manoj GK MD
Senior Consultant Anesthesiologist
Fortis Hospital, Bengaluru, Karnataka, India

Masuma Movli Manasawala
Cutis Skin Studio
Mumbai, Maharashtra, India

Milind N Naik MD
Ophthalmic and Facial Plastic Surgery
LV Prasad Eye Institute
Hyderabad, Telangana, India
Orbito-Facial Fellow, UCLA, Los Angeles (2006-07)
E-mail: milnaik@gmail.com

MK Shetty MD
Consultant Dermatologist and Cosmetic Laser Physician
Dr Shetty’s Medical and Aesthetic Skin Solutions Prestige Delta
Bengaluru, Karnataka, India
E-mail: your_dermatologist@hotmail.com

Maya Vedamurthy MAMS FRCP (Edin)
Consultant Dermatologist
RSV Skin and Laser Centre
Apollo Hospitals, Chennai, Tamil Nadu, India

Mukta Sachdeva MD
Senior Consultant Dermatologist
Department of Dermatology
Manipal Hospital
Bengaluru, Karnataka, India

Munishe Paul MD
Consultant Dermatologist
Skin Laser Center, New Delhi, India
E-mail: paul_munish@yahoo.com

Murali Chakravarthy MD DA DNB FIACTA FICC
Chief Consultant
Department of Anesthesia
Critical Care and Pain Relief
Fortis Hospital
Bengaluru, Karnataka, India
E-mail: mailchakravarthy@gmail.com

Narendra Gokhale MD
Consultant Dermatologist
Indore, Madhya Pradesh, India

Narendra Patwardhan MD IV (London) DVD
Shreeraj Hospital, Pune, Maharashtra, India
Ex President: AHRS India
Ex Vice President: IADVL
Ex President: IADVL (Maharashtra)
Ex President: ACS(I)
E-mail: ngpatwardhan@gmail.com

Nicholas Collier MD
Senior Consultant Dermatologist
Department of Dermatology, Manipal Hospital
Bengaluru, Karnataka, India

Nidhi S Tandon MD
Consultant Dermatologist, SkinArt Clinic
Lucknow, Uttar Pradesh, India

Nilesh Goel MD
Consultant Dermatologist
SkinArt Clinic, Lucknow, Uttar Pradesh, India

Nirav V Desai MBBS DNB (Dermatology)
Consultant Dermatologist
Surat, Gujarat, India

Niti Khunger MD DDU DNB
Professor
Consultant Dermatologist
VM Medical College and Safdarjung Hospital
New Delhi, India
Ex-President: Association of Cutaneous Surgeons ACS(I)
Associate Editor: Journal of Cutaneous and Aesthetic Surgery
Author: Chemical Peels

Omprakash HM MD
Consultant Dermatologist
Vikram Hospital, Mysore, Karnataka, India
E-mail: drhnoomprakash@yahoo.com

Parimalam Kumar MD DDU DNB
Senior Assistant Professor
Department of Dermatology
Stanley Medical College
Chennai, Tamil Nadu, India
E-mail: drparimalam@gmail.com

Partha Mahapatra
Junior Resident
Department of Dermatology
Institute of Naval Medicine, INHS Asvini
Mumbai, Maharashtra, India

Pradeep Kumari DNB FCPS DVD MBBS
Asia Institute of Hair Transplant
Pune, Maharashtra, India
E-mail: drgahlotpradeep@gmail.com

Pradumn Vaidya MBBS DVD DNB
Consultant Dermatologist
Skin and Laser Clinic
Pune, Maharashtra, India
E-mail: drpvaidya@gmail.com

Pawan Raj R MD FRIUHS (Dermatosurgery)
Cutis Academy of Cutaneous Sciences
Bengaluru, Karnataka, India
E-mail: pavanraj.r@gmail.com
Prangya Parimita Rana  
Fellowship Trainee  
Venkat Charmalaya  
Centre for Advanced Dermatology  
Bengaluru, Karnataka, India

Rachana Shilpakar MD  
Consultant Dermatologist  
Department of Dermatology and Aesthetic Medicine  
MS Skin Centre  
Bengaluru, Karnataka, India

Rachita Dhurat  
Department of Dermatology  
Lokmanya Tilak Municipal Medical College and General Hospital  
Mumbai, Maharashtra, India  
E-mail: rachtadhurat@yahoo.co.in

Rachita Narad MD  
Consultant Dermatologist  
Kanpur, Uttar Pradesh, India  
E-mail: drnamad_rachita@yahoo.in

Ragini Ghiya MD  
Consultant Dermatologist and Hair Transplant Surgeon  
Siddharth Clinic  
Surat, Gujarat, India  
E-mail: drraginighiya@gmail.com

Ragunath S MD  
Associate Professor  
Department of Dermatology, Venereology and Leprosy  
Sri Siddhartha Medical College  
Tumkur, Karnataka, India  
E-mail: drragus@yahoo.co.in

Raghunath Reddy R MD DNB FRGUHS (Dermatosurgery)  
Professor  
Consultant Dermatologist and Dermatosurgeon  
Dr Raghu’s Mathapitha Polyclinic  
Bengaluru, Karnataka, India

Rajat Kandhari MD  
Senior Resident  
VM Medical College and Safdarjung Hospital  
New Delhi, India  
E-mail: rtkandhari@gmail.com

Rajesh M Buddhadev MD  
Senior Consultant  
Dermatologist and Aesthetic Dermatosurgeon  
President, NU Skin World  
Surat, Gujarat, India  
E-mail: buddhadev1@gmail.com

Rajeev Dami Setty MD (Dermatology)  
Additional Medical Director  
Oliva Chain of Hair and Skin Clinics  
Hyderabad, Telangana, India  
E-mail: drrajeevdamisetty@gmail.com

Rashmi Sarkar MD MAMS  
Associate Professor Department of Dermatology  
Maulana Azad Medical College and Lok Nayak Hospital, New Delhi, India  
E-mail: rashmisarkar@gmail.com

Rasya Dixit MD MBBS  
Sri Sai Pinnacle Ashoka Avenue  
KR Garden, Murgeshpalya, Bengaluru, Karnataka, India  
E-mail: Dr.rasya@gmail.com

Reena Rai MD  
Professor  
PSG Institute of Medical Science and Research  
Coimbatore, Tamil Nadu, India  
E-mail: drreena_rai@yahoo.co.in

Rekha Shethi MD DVD  
Consultant Dermatologist  
Yuva Skin & Hair Clinics LLP  
Mumbai, Maharashtra, India

Revanta Saha  
Dermatologist  
Venkat Charmalaya, Centre for Advanced Dermatology  
#3437 1st ‘G’ cross, 7th main, Subbanna Garden, Vijayanagar  
Bengaluru, Karnataka, India

R Jayashree  
PSG Institute of Medical Science and Research  
Coimbatore, Tamil Nadu, India  
E-mail: drreena_rai@yahoo.co.in

S Sachidanand MBBS MD DNB DVD FRCP (Glasgow)  
Director of Medical Education  
Department of Medical Education  
Government of Karnataka  
Bengaluru, Karnataka, India

Sadhana Deshmukh DNB  
Forever Younag Skin Hair Body Aesthetics Clinic  
Maharashtra, India

Sandeep Sattur  
MS MCH (Plastic Surgery) Consultant Hair Transplant Surgeon  
Hairrevive-Centre for Hair Restoration and Skin Rejuvenation  
Mumbai, Maharashtra, India  
E-mail: drsattur@hairrevive.com

Sandeep Savant MD  
Mumbai, Maharashtra, India  
E-mail: drsandeepswant@gmail.com

Sangeeta Varma MD  
Senior Consultant in Kaya Skin Clinic and Apollo Clinic, Sector 14  
Gurgaon, Haryana, India  
E-mail: Sangvarma@yahoo.com

Sanjay Sane  
Consulting Foot Surgeon  
Diabetic Foot Clinic  
Maharashtra Medical Foundation’s Joshi Hospital  
Pune, Maharashtra, India  
E-mail: sane@doctor.com

Sanjay Singh MD  
Gauram Nagar, New Delhi, India  
E-mail: sanjayssinghsnmcs007@gmail.com

Sanjeev Aurangabadkar MD  
Consultant Dermatologist and Laser Surgeon  
Skin and Laser Clinic  
Hyderabad, Telangana, India  
E-mail: sanjeev.aurangabadkar@gmail.com

Sanjeev Gupta MD DNB MAMS  
Professor and Head  
Department of Dermatology  
MM Institute of Medical Sciences and Research  
Ambala, Punjab, India  
E-mail: Sanjeevguptadr@gmail.com
Sandeep Mulekar MD
Consulting Dermatologist
National Centre for Vitiligo and Psoriasis
Riyadh, Saudi Arabia

Satish S Savant FAMS FCPS DVD DDV
Head, Department of Skin and STD
Dr Balabhai Nanavati Hospital and Medical Research Centre
West Mumbai, Maharashtra, India
E-mail: drsatishsavan@ yahoo.co.in

Savita Yadav MD
Department of Dermatology
All India Institute of Medical Sciences
New Delhi, India

Savitha AS MD DNB FRGUS (Dermatosurgery)
Assistant Professor
Department of Dermatology
Sathagiri Institute of Medical Sciences and Research Institute
Bengaluru, Karnataka, India
E-mail: drsavitahasomaiah@gmail.com

SDN Guptha MD
Consultant Dermatologist
Sri Satya Sai General Hospital
Bengaluru, Karnataka, India
E-mail: sdnguptha@gmail.com

Seema Garg
Consultant
Rejuvenate Hair Transplant Centre
Indore, Madhya Pradesh India
E-mail: nilgarg61@yahoo.com

Sushil Kumar BM MD (DVL) FADVL (Dermatopatho)
Associate Professor
Department of Dermatology
Venerology and Leprosy
Mandya Institute of Medical Sciences
Mandya, Karnataka, India

Shehnaaz Arsawala MD DDV
Renewderm Skin
Hair Laser, Aesthetic Center
Mumbai, Maharashtra, India
E-mail: drshehna@gmail.com

Shilpa K MD
Assistant Professor
Bangalore Medical College and Research Institute
Bengaluru, Karnataka, India

Shyamanta Barda MD
Assistant Professor
Assam Medical College and Hospital
Dibrugarh, Assam, India
E-mail: drshhyamanta@gmail.com

Sidharth Sonthalia MD DNB MNAMS
Consultant Dermatologist
SKINOCENCE, The Skin Clinic
Gurugram, Haryana, India
E-mail: sidharth.sonthalia@gmail.com

Siloni Sachdeva MD
Consultant Dermatologist
Carolina Skin and Laser Centre
Jalandhar, Punjab, India
E-mail: siloniederm@yahoo.com

Sindhu Potla MD (DVL) FRGUS
Consultant Dermatologist
Curis Clinic
Bengaluru, Karnataka, India
E-mail: sindhupotla9@gmail.com

Sita GL
Consultant Dermatologist
Venkat Charamlaya, Centre for Advanced Dermatology
Bengaluru, Karnataka, India

Smriti Naswa MD
Consultant, Department of Skin
Government Medical College and SSG Hospital
Vadodara, Gujarat, India

Somesh Gupta MD DNB MNAMS
Professor
Department of Dermatology and Venereology
All India Institute of Medical Sciences
New Delhi, India
E-mail: someshgupta@hotmail.com

Sonam Vimalalal MBBS DVL
Consultant Dermatologist,
Dr. Malavika Kohli and Associates
Skin Secrets
Mumbai, Maharashtra, India
E-mail: sonam.v7@yahoo.com

Subhodip Mitra
Consultant
Department of Dermatology
Vydehi Institute of Medical Sciences and Research Center
Bengaluru, Karnataka, India

Subodh Jane MD FRGUS
Amravati, Maharashtra, India
E-mail: dr.subodhjane86@gmail.com

Subodh Sirur MBBS DVD DNB
Consultant Dermatologist
Wockhardt Hospital, Apollo Spectra
Mahatma Gandhi Memorial Hospital
Mumbai, Maharashtra, India

Sujala S Aradhya
Consultant Dermatologist and Dermatosurgeon
Sujala Polyclinic and Laboratory
Bengaluru, Karnataka, India

Sujay Khandpur MD DNB MNAMS
Additional Professor
Department of Dermatology and Venereology
All India Institute of Medical Sciences
New Delhi, India
E-mail: sujay.khandpur@yahoo.com

Sujit Shanshanwala
Department of Dermatology
Lokmanya Tilak Municipal Medical College and General Hospital
Mumbai, Maharashtra, India
E-mail: shanshanwal.sujit@gmail.com

Sunaina Hameed MD
Medical Director and Consultant Dermatologist Skin
Health Advanced Dermatology Center
Bengaluru, Karnataka, India
Suresh Talwar  
Senior Consultant Dermatologist, Talwar Skin Institute  
Lucknow, Uttar Pradesh, India  
E-mail: drsuresh talwar@gmail.com

Sushil Talibani  
MD, DV & D  
Consultant Dermatologist  
Mumbai, Maharashtra, India  
E-mail: drsushiltalibani@gmail.com

Swapan Shah  
Consultant Dermatologist  
Solapur, Maharashtra, India  
E-mail: drswapan shah@gmail.com

Swati Mogra  
MBBS  
Postgraduate Student, Dermatology  
Department of Dermatology  
Manipal Hospital  
Bengaluru, Karnataka, India  
E-mail: swatimogra@gmail.com

Swati Mutha  
MBBS, DDV  
Consulting Dermatologist  
Dr Malavika Kohli and Associates  
Skin Secrets, Mumbai, Maharashtra, India

Tanvi Gupta  
Dermatologist, The Skin Clinic  
Gwalior, Madhya Pradesh, India

T. Salim  
MD, DNB  
Medical Director and Clinical Head  
Cutis Institute of Dermatology and Aesthetic Sciences  
Calicut, Kerala, India

TS Nagesh  
Professor, Department of Dermatology  
Venerology and Leprosy, SIMS and RC  
Bengaluru, Karnataka, India

TS Vidyadhar  
MBBS, MD (GERMS (MED Cosmetology))  
Skin and Cosmetic Clinic  
Bengaluru, Karnataka, India  
E-mail: vidyadhar@gmail.com

Uday Kelkar  
MBBS, MD (Microbiology)  
Senior Chief Medical Officer, Senior Administrative Grade  
In-Charge Laboratories  
Central Govt. Health Scheme, Pune  
Ministry of Health and Family Welfare  
Government of India  
Pune, Maharashtra, India  
E-mail: udakelkar@gmail.com

Umashankar Nagaraju  
MBBS, MD (ACS(I))  
Hon General Secretary, ACS(I)  
Professor, Department of Dermatology  
Rajarajeshwari Medical College and Hospital  
Bengaluru, Karnataka, India  
Consultant Dermatologist and Cutaneous Surgeon  
Apollo Hospitals, Bengaluru, Karnataka, India  
E-mail: usdernavision@gmail.com

Vaishalee Kirane  
MBBS, DDV  
Dermatologist and Trichologist  
Ruby Hall Clinic, Adivya Birla Hospital and Joshi Hospital, Pune, Maharashtra, India  
E-mail: vaishaleepk@gmail.com

Vani Yepuri  
Consultant Dermatologist  
Venkat Charnalaya  
Centre for Advanced  
Dermatology, Bengaluru, Karnataka, India

Venkata Sambara  
MBBS, MD  
Consultant Dermatologist  
Dr Balabhai Nanavati Hospital and Research Centre  
Mumbai, Maharashtra, India

Vishal Chugh  
MBBS, MD (Dermatology)  
Senior Consultant Dermatologist  
Dr Nair’s Skin Clinic, Mumbai, Maharashtra, India

Vishwanath Jigjinni  
MBBS, MS (Plastic Surgery)  
Hon Plastic Surgeon  
Ruby Hall Clinic and Jehangir Hospital  
Pune, Maharashtra, India  
E-mail: plasticsurgeon1@hotmail.co.uk

Vivek Nair  
MBBS, MD (Dermatology)  
Consultant Dermatologist  
Dr Nair’s Skin Clinic, Mumbai, Maharashtra, India

Yashwant Tawade  
MBBS, MD (Dermatology)  
Professor and Head  
Department of Dermatology Gynecology and Venereology  
KEM Hospital, Pune, Maharashtra, India  
E-mail: yash tawade@gmail.com

YS Marfatia  
MBBS, MD  
Professor and Head  
Department of Skin-VD Medical College  
SSG Hospital Vadodara, Gujarat, India  
E-mail: ym1126@gmail.com

Akshitha Shetty  
MBBS, MD  
Yuva Skin & Hair Clinics LLP  
Mumbai, Maharashtra, India

Shreya Pagariya Golchha  
MBBS, MD  
Yuva Skin & Hair Clinics LLP  
Mumbai, Maharashtra, India
The most satisfying aspect of editing and authoring a book is when a second edition becomes due, very soon after the first edition. *ACSI Textbook of Cutaneous and Aesthetic Surgery* got sold out within months of its release, and several reprints had to be brought out. The preparation for the second edition began in 2016 and it is most satisfying that this edition is being brought out at the World Congress of Cosmetic Dermatology in May 2017 at Bengaluru, Karnataka, India as a thoroughly revised and enlarged version.

It was Charles Darwin who said, "*It is not the most intellectual of the species that survives; it is not the strongest that survives; but the species that survives is the one that is able to adapt to and to adjust best to the changing environment in which it finds itself.*" This applies cogently to the dermatologist and to the subject of dermatosurgery. The subject has changed drastically and expanded exponentially, and the dermatosurgeon has had to adapt to this change. This change can be seen in this second edition. It has expanded from 66 chapters to 152 chapters; the number of authors has expanded from 105 to 147. New topics and new sections have been added apart from a thorough revision of the existing chapters. We hope the readers will receive these changes with enthusiasm.

While thin things change, certain things remain the same. Dermatosurgery continues to represent a Theseus’ paradox: "*This is my grandfather’s axe. My father replaced the shaft and I put a new head on it. It’s my grandfather’s axe.*"

I have, therefore, no hesitation in reproducing the following paragraphs from the preface to the first edition:

"Writing a book is an experience—exhilarating at times, excruciating at others. And, in a multiauthored book, it is even more so, as deadlines are chased furiously and frenetically. Despite the highs and the lows, I must say the experience has been something to cherish—it has been my privilege to have been the Editor-in-Chief for this effort—and on behalf of the editorial board, I thank each author for his contribution. It truly has been a great work done by a number of smaller things together!"

I was indeed fortunate to have an experienced editorial board of senior dermatosurgeons, available at all times for counsel and advice. My heartfelt gratitude to each one of them. And I record with a touch of pride and happiness the splendid work done by my young team of deputy and assistant editors, who toiled for long hours in correcting proofs, and drafts. The book would not have been possible without their long endeavors. In particular, the Associate Editor, Manjot Marwah has made a singular contribution and I place on record my appreciation and thanks to her.

Lastly, an effort of this size is never possible without the support and understanding from the family—my wife Dr Jayashree, my son Aniketh (both of whom contributed as authors) and daughter Ankitha (who supported silently)—my heartfelt thanks to them.

Jaypee Brothers Medical Publishers (P) Ltd. has done an outstanding work in bringing this book out on time—in particular, my thanks to Shri Jitendar P Vij (Group Chairman), Mr Ankit Vij (Group President), Ms Chetna Malhotra Vohra (Associate Director—Content Strategy), Ms Nikita Chauhan (Development Editor), and the production team—my gratitude to them.

It is my fond hope that this edition too will be well received and appreciated by the readers and the grandfather’s axe shall improve further!

Mysore Venkataram
Preface to the First Edition

Dermatosurgery has been passing through interesting times, as disease dermatology paves the way for desire dermatology, as illness gets replaced by wellness and patients are replaced by clients—today's interventional dermatology seeks to dominate over armchair dermatology of yesterday. What we now have is a youthful, vibrant, fast-changing subspecialty. Change has been so striking over the last decade that, in some ways, dermatosurgery represents a Theseus' paradox: "This is my grandfather's axe. My father replaced the shaft, and I put a new head on it. It's my grandfather's axe."

Despite the rapid progress, there have been few books in this field, specially focusing on brown skin, and the need for a comprehensive book, encompassing all the aspects of cutaneous surgery, lasers and aesthetics, has long been felt. Sensing this need, the Association of Cutaneous Surgeons (I) decided to bring out this book.

The rapidly changing profile, range and scope of the subject, with multitudes of procedures being performed, necessitated a multiauthored book. Fortunately, our association is blessed with the talent that was needed for authoring the chapters—the result is what you see; an exhaustive compilation with 66 chapters, including nearly 33 subchapters, by as many as 105 authors. Every aspect of cutaneous surgery has been comprehensively dealt with, keeping in mind the recent advances.

The brown skin has many peculiarities and variations—in fact, it defies any classification! Pigmentation response, healing and scarring reactions, aging changes are all different in the brown skin. Similarly, the epidemiological situations are also different; vitiligo surgery is more relevant than skin cancer surgery! The textbook aptly seeks to address these challenges and requirements.

Our effort has been to keep the book comprehensive, yet simple; to make the book all-inclusive, yet reader-friendly; exhaustive and yet relevant—to the beginner and the expert, the novice and the connoisseur. We hope that we have succeeded in achieving this objective.

Writing a book is an experience, exhilarating at times, excruciating at others. And, in a multiauthored book, it is even more so, as deadlines are chased furiously and frenetically. Despite the highs and the lows, I must say the experience has been something to cherish—it has been my privilege to have been the Editor-in-Chief for this effort—and on behalf of the editorial board, I thank each author for his contribution. It truly has been a great work done by a number of smaller things together!

I was indeed fortunate to have an experienced editorial board of senior dermatosurgeons, available at all times for counsel and advice. My heartfelt gratitude to each one of them. And I record with a touch of pride and happiness the splendid work done by my young team of deputy and assistant editors, who toiled for long hours in correcting proofs, and drafts. The book would not have been possible without their long endeavors.

Lastly, an effort of this size is never possible without the support and understanding from the family—my wife Dr Jayashree, my son Aniketh (both of whom contributed as authors) and daughter Ankitha (who supported silently)—my heartfelt thanks to them.

M/S Jaypee Brothers Medical Publishers have done an outstanding work in bringing it out on time—in particular, my thanks to Mr Jitendar P Vij (CEO), Ms Sunita Katla (PA to CEO), Ms Shagufta Khan (Exec. Asst. to MD), Mr Sumit Kumar and Mr Ram Murti (Graphic Designers), Ms Geeta Srivastava and Laxmidhar Padhiary (Proofreaders) and Mr Venugopal (Branch Manager). My gratitude to them.

I earnestly hope that the book will be appreciated by the readers, and welcome comments and feedback. My earnest hope is that book will serve as an instrument in furthering progress in the field, and the grandfather's axe shall improve further!

Mysore Venkataram
## Contents

### Volume 1

#### Section 1: Basic Principles of Cutaneous Surgery

1. **Skin: Basic Aspects**  
   *Shashikumar BM*  
   Page 3

2. **Applied Surgical Anatomy in Relation to Facial Rejuvenation**  
   *Mukta Sachdev, Sunaina Hameed, Keerthi Velugotla*  
   Page 9

3. **Regional Anatomy**  
   *Madura C, Balaji AP*  
   Page 29

4. **Wound Healing**  
   *CR Srinivas, C Shanmuga Sekar*  
   Page 50

5. **Wound Management**  
   *Manas Chatterjee, BS Gill, GR Rajput*  
   Page 57

6. **Bandages in Dermatosurgery**  
   *Umashankar Nagaraju*  
   Page 71

7. **Universal Precautions for a Dermatologist**  
   *YS Marfatia, Smriti Naswa*  
   Page 83

8. **Dermatosurgical Instruments**  
   *Anirudha Gulanikar*  
   Page 106

9. **Wound Closure Materials and Techniques in Dermatosurgery**  
   *Umashankar Nagaraju*  
   Page 118

10. **Setting Up a Dermatosurgery Unit**  
    *HM Omprakash*  
    Page 143

11. **Disinfection and Sterilization**  
    *Uday Kelkar*  
    Page 153

12. **Local Anesthesia**  
    *KC Nischal*  
    Page 170

13. **Tips and Tricks for Using Local Anesthesia for Dermatosurgical Procedures**  
    *Dhepe Niteen V*  
    Page 189

14. **Tumescent Local Anesthesia**  
    *Jayashree Venkataram, Venkataram Mysore, Aniketh Venkataram*  
    Page 194

15. **Nerve Blocks in Dermatosurgery**  
    *Savitha AS, Venkataram Mysore*  
    Page 199

16. **Hemostasis in Dermatologic Surgery**  
    *T Salim*  
    Page 222
Section 2: Standard Cutaneous Surgical Techniques

22. Simple Dermatosurgical Procedures: Biopsy, Curettage and Chemical Cautery
   Dhanashree Bhide
   265

23. Simple Excisions
   Vinay Saraf, Ragunatha S
   283

24. Electrosurgery
   Rashmi Sarkar, Vivek Nair
   296

25. Radiofrequency in Dermatology
   Yashwant Tawade, Ekta Romi
   306

26. Cryotherapy
   Sujay Khandpur
   314

27. Surgical Management of Cutaneous Cysts and Lipomas
   Vinay Saraf, Ragunatha S
   326

28. Flaps for Facial Reconstruction
   Vishwanath Jigjinni
   335

29. Flap Surgeries: A Dermatologist’s Perspective
   Biju Vasudevan, Divya Gorur, Shilpa K
   350

30. Scar Revision
   Raghunatha Reddy R, Shashikumar BM, Savitha AS
   357

31. Dermabrasion
   Satish S Savant, Sandeep Savant, Behroze M Deputy
   373

32. Keloids and Hypertrophic Scars
   Sanjay Singh, Savita Yadav, Sangeeta Varma, Somesh Gupta
   381

Section 3: Special Cutaneous Surgical Procedures

Vitiligo Surgeries

33. Overview of Vitiligo Surgery
   Mysore Venkataram, Koushik Lahiri
   401

34. Minigrafting for Vitiligo
   Koushik Lahiri
   408

35. Suction Blister Epidermal Grafting
   Shyamanta Barua
   418
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>36.</td>
<td>Thin Split Thickness Skin Grafting for Vitiligo</td>
<td>426</td>
</tr>
<tr>
<td></td>
<td>Niti Khunger, Rajat Kandhari</td>
<td></td>
</tr>
<tr>
<td>37A.</td>
<td>Epidermal Noncultured Cell Suspension in Vitiligo</td>
<td>434</td>
</tr>
<tr>
<td></td>
<td>Munish Paul</td>
<td></td>
</tr>
<tr>
<td>37B.</td>
<td>Vitiligo Surgery: Mega Sessions</td>
<td>442</td>
</tr>
<tr>
<td></td>
<td>Munish Paul</td>
<td></td>
</tr>
<tr>
<td>38.</td>
<td>Noncultured Extracted Hair Follicle Outer Root Sheath Cell Suspension</td>
<td>451</td>
</tr>
<tr>
<td></td>
<td>Savita Yadav, Sanjay Singh, Somesh Gupta</td>
<td></td>
</tr>
<tr>
<td>39.</td>
<td>Cultured Melanocyte Transplantation</td>
<td>456</td>
</tr>
<tr>
<td></td>
<td>Kanika Sahni, Davinder Parsad</td>
<td></td>
</tr>
<tr>
<td>40.</td>
<td>Phototherapy with Grafting Procedures in Vitiligo</td>
<td>461</td>
</tr>
<tr>
<td></td>
<td>Imran Majid</td>
<td></td>
</tr>
<tr>
<td>41.</td>
<td>Vitiligo: Other Modalities of Treatment</td>
<td>464</td>
</tr>
<tr>
<td></td>
<td>Dilip Kachhawa</td>
<td></td>
</tr>
<tr>
<td>42.</td>
<td>Innovations and Pearls in the Surgical Management of Vitiligo</td>
<td>469</td>
</tr>
<tr>
<td></td>
<td>KT Ashique, Feroze Kaliyadan</td>
<td></td>
</tr>
<tr>
<td>43.</td>
<td>Surgical Management of Non-vitiligo Leukoderma: An Update (A Review)</td>
<td>474</td>
</tr>
<tr>
<td></td>
<td>Sanjeev Mulekar, Madhulika Mhatre</td>
<td></td>
</tr>
<tr>
<td>44.</td>
<td>Complications of Vitiligo Surgery</td>
<td>481</td>
</tr>
<tr>
<td></td>
<td>Niti Khunger, Alka Goel</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Acne Scar Surgeries</strong></td>
<td></td>
</tr>
<tr>
<td>45.</td>
<td>Overview of Acne Scarring</td>
<td>489</td>
</tr>
<tr>
<td></td>
<td>Anil Abraham</td>
<td></td>
</tr>
<tr>
<td>46.</td>
<td>Surgical Management of Acne Scars</td>
<td>494</td>
</tr>
<tr>
<td></td>
<td>T Salim, Ragini Ghiya</td>
<td></td>
</tr>
<tr>
<td>47.</td>
<td>Acne Scars: Treatment with Lasers</td>
<td>508</td>
</tr>
<tr>
<td></td>
<td>Imran Majid</td>
<td></td>
</tr>
<tr>
<td>48.</td>
<td>Approach to Management of Post-acne Scars</td>
<td>514</td>
</tr>
<tr>
<td></td>
<td>BS Chandrashekhar, Mysore Venkataram</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Skin Cancer</strong></td>
<td></td>
</tr>
<tr>
<td>49.</td>
<td>Mohs Micrographic Surgery</td>
<td>520</td>
</tr>
<tr>
<td></td>
<td>Nicholas Collier, Venura Sanjarasinghe, Vishal Madan</td>
<td></td>
</tr>
<tr>
<td>50.</td>
<td>Melanoma</td>
<td>531</td>
</tr>
<tr>
<td></td>
<td>Nicholas Collier, Firas Al-Niami, Vishal Madan</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Veins</strong></td>
<td></td>
</tr>
<tr>
<td>51.</td>
<td>Varicose Veins: An Overview</td>
<td>549</td>
</tr>
<tr>
<td></td>
<td>S Sacchidanand, BS Shivaswamy, Aniketh Venkataram</td>
<td></td>
</tr>
<tr>
<td>52.</td>
<td>Sclerotherapy</td>
<td>559</td>
</tr>
<tr>
<td></td>
<td>S Sacchidanand, TS Nagesh, Sujala S Aradhya</td>
<td></td>
</tr>
<tr>
<td>53.</td>
<td>Sclerotherapy for Vascular Malformations</td>
<td>569</td>
</tr>
<tr>
<td></td>
<td>Sujay Khandpur</td>
<td></td>
</tr>
<tr>
<td>54.</td>
<td>Leg Ulcers</td>
<td>578</td>
</tr>
<tr>
<td></td>
<td>Reena Rai, R Jayashree, CR Srinivas</td>
<td></td>
</tr>
</tbody>
</table>
### Nail Surgeries

55. **Surgery of Nails**  
   *Sushil Tahiliani, Harsh Tahiliani, Manjit Sandhu Tahiliani*  
   Page 590

56. **Surgery and Cosmetic Procedures of Nails: Excision of Subungual Tumors**  
   *Chander Grover, Archana Singal*  
   Page 602

### Regional Dermatosurgery

57. **Eyelid Surgery**  
   *Manas Chatterjee, Dipali Rathod, Krishan Mehra, Harish Prasad*  
   Page 610

58. **Dermatologic Surgery of the Lips**  
   *Raghunatha RR, Shashikumar BM, Savitha AS*  
   Page 631

59. **Surgery on the Ear**  
   *Raghunatha Reddy, Savitha AS, Shashikumar BM*  
   Page 644

60. **Hidradenitis Suppurativa**  
   *M Kumaresan*  
   Page 664

61. **Circumcision**  
   *Aniketh Venkataram, SDN Guptha, Vishal Chugh*  
   Page 673

### Surgeries in Leprosy

62. **Leprosy Surgery**  
   *Sanjay Sane*  
   Page 679

63. **Nerve Biopsy: Technique and Role in Dermatology**  
   *Raghunatha Reddy R, Shashikumar BM, Savitha AS*  
   Page 687

### Basic Aesthetics

64. **Pathophysiology of Aging Skin**  
   *Manjot Marwah, Nidhi S Tandon*  
   Page 695

65. **Clinical Features of Aging**  
   *Shashikumar BM, Kavya M*  
   Page 702

66. **Approach to Management of Aging Skin**  
   *Niti Khunger, Jyoti Gupta*  
   Page 711

67. **Cosmeceuticals**  
   *Ankur Talwar, Rajetha Dami Setty*  
   Page 716

68. **Systemic Nutraceuticals**  
   *TS Vidya, Ankur Talwar*  
   Page 725

### Peels

69. **Glycolic Acid Peels**  
   *Niti Khunger, Jyoti Gupta*  
   Page 735

70. **Salicylic Acid and Trichloroacetic Acid Peel**  
   *Abhishek De, Aarti Sarda*  
   Page 742
## Contents

### Newer Superficial Peels

Ankur Talwar, Kshama Talwar 749

### Injectables

72. Botulinum Toxin: Pharmacology  
Rasya Dixit 759

73. Botulinum Toxin for the Upper Face  
MK Shetty 764

74. Botulinum Toxin for the Midface, Lower Face and Neck  
Shehnaz Arsiwala, Rajat Kandhari 771

75. Non-Cosmetic Dermatological Indications of Botulinum Toxin  
Mukta Sachdev, Rachana Shilpakar 782

76. General Principles of Soft Tissue Augmentation  
Shehnaz Arsiwala, Sadhana Deshmukh 797

77. Soft Tissue Augmentation: Hyaluronic Acid Fillers  
Maya Vedamurthy 806

78. Non-hyaluronic Acid Fillers  
Jaishree Sharad 816

79. Hand Rejuvenation  
Maya Vedamurthy 825

80. Tear Trough Correction with Fillers  
Malavika Kohli, Sonam Vimadalal, Banani Choudhury 831

81. Lip Augmentation  
Malavika Kohli, Swati Mutha, Banani Choudhury 843

82. Complications of Fillers  
Shehnaz Arsiwala 858

83. Overall Approach to Injectables in Rejuvenation  
Rekha Seth, Akshitha Shetty, Shreya Pagariya Golchha 867

### Other Cosmetic Procedures

84. Microdermabrasion  
Silonie Sachdeva, Sitara GL, Prangya Parimita Rana 876

85. Microneedling  
Jaishree Sharad, Vani Yepuri, Sitara GL 885

86. Stretch Marks  
Chandrashekar BS, Chaithra Shenoy 892

### Nail Surgeries

87A. Cosmetic Problems of Nails Disorders  
Chander Grover, Archana Singal 897

87B. Aesthetic of Nails  
Mukta Sachdev, Swati Mogra, Keerthi Velugotla 903

### Other Cosmetic Procedures

88. Suspending Devices  
Pradeep Kumari 907
## Pigmentation Problems and their Aesthetic Management

89. **Platelet-rich Plasma Therapy**  
*Swapnil Shah*  
913

90. **Periocular Darkening and Rejuvenation**  
*Manas Chatterjee, Partha Mahapatra*  
925

91. **Blepharoplasty and Periorbital Surgical Rejuvenation**  
*Milind N Naik*  
938

92A. **Melasma and its Aesthetic Management**  
*Biju Vasudevan, Indrashis Podder*  
953

92B. **Approach to Procedural Management of Diffuse Facial Melanosis**  
*Manas Chatterjee, Dipali Rathod*  
963

## Hair Transplantation

93. **Androgenetic Alopecia: An Approach to a Patient**  
*Chandrashekar BS, Madura C, Pavan Raj R*  
984

94. **Psychology of a Hair Loss Patient**  
*Manjot Marwah, Venkataram Mysore*  
993

95. **Basic Principles of Hair Transplantation**  
*Aniketh Venkataram, Venkataram Mysore*  
998

96. **Case Selection and Counseling**  
*Vaishalee Kirane*  
1002

97. **Design of Anterior Hairline in Male Pattern Baldness**  
*Anil Kumar Garg, Seema Garg*  
1008

98. **Donor Area Strip Dissection**  
*Anil K Garg, Seema Garg*  
1014

99. **Donor Area: Follicular Unit Extraction**  
*Aman Dua, Nirav V Desai*  
1023

100. **Hair Transplantation: Recipient Area**  
*Venkataram Mysore, Aniketh Venkataram*  
1033

101. **Complications of Hair Restoration Surgery**  
*Narendra Patwardhan, Vaishalee Kirane*  
1042

102. **Body Hair Transplantation**  
*Kuldeep Saxena*  
1048

103. **Non Hair Transplantation Methods of Surgical Hair Restoration**  
*Sandeep Sattur*  
1059

104. **Scalp Micropigmentation**  
*Rachita Dhurat, Sujit Shanshanwal*  
1069

105. **Ethical Aspects and Training in Hair Transplantation**  
*Arika Bansal*  
1078

106. **Setting Up a Hair Clinic**  
*Kavish Chouhan, Amrendra Kumar*  
1082

## Liposuction and other Related Fat Procedures

107. **Manual Liposuction**  
*Nilesh Goyal*  
1089
Section 5: Laser, Lights and Other Technologies

112. History and Evolution of Energy-based Dermatosurgical Devices
    Omprakash HM

113. Laser Tissue Interactions and their Clinical Relevance
    Kabir Sardana

114. Setting Up a Laser Theater
    Niteen V Dhepe

115. Laser Hair Removal: Basic Principles
    Vaishalee Kirane

116. Laser-and-Light-assisted Hair Removal: Clinical Aspects
    Rajesh M Buddhadev, Sitara GS

117. Different Wavelengths for Hair Removal
    Anurag Tiwari

118. Carbon Dioxide Laser
    Krupa Shankar DS, Chakravartthi M

119. Er:YAG Laser
    Subodh Jane, Venkataram Mysore

120. Lasers for Pigmented Lesions
    Sanjeev Aurangabadkar

121. Lasers for Tattoo Removal
    Sanjeev J Aurangabadkar

122. Lasers for Vascular Lesions
    M Kumaresan, CR Srinivas

123. Fractional Lasers
    Anil Ganjoo

124. Nonablative Lasers, Lights and Other Technologies in Dermatology
    Mukta Sachdev, Sunaina Hameed, Rachana Shilpokar

125. Microneedle Radiofrequency
    Swapnil Shah

126. Noninvasive Body Contouring
    Chandrashekar BS, Sindhu Potla

127. Complications of Lasers
    Apratim Goel, Masuma Molvi Manasawala

Section 6: Miscellaneous Topics

128. Patient Satisfaction
    Bhanu Prakash
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Author(s)</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>129.</td>
<td>Psychology of an Aesthetic Patient</td>
<td>Manjot Marwah</td>
<td>1327</td>
</tr>
<tr>
<td>130.</td>
<td>Body Dysmorphic Disorder</td>
<td>Abdul Latheef EN</td>
<td>1332</td>
</tr>
<tr>
<td>131.</td>
<td>Isotretinoin and Procedures in Dermatology Reviewing Clinical Significance</td>
<td>Venkatakr Mysore, Omprakash HM, Revanta Saha</td>
<td>1338</td>
</tr>
<tr>
<td>132.</td>
<td>Evidence-based Medicine in Cutaneous and Aesthetic Surgery</td>
<td>Rashmi Sarkar, Sidharth Sonthalia, Tanvi Gupta, Venkataram Mysore</td>
<td>1342</td>
</tr>
<tr>
<td>133.</td>
<td>Accreditation</td>
<td>Bhanu Prakash, Subhodip Mitra</td>
<td>1348</td>
</tr>
<tr>
<td>134.</td>
<td>Medicolegal Issues in Aesthetic Surgery</td>
<td>KH Satyanarayana Rao</td>
<td>1352</td>
</tr>
<tr>
<td>135.</td>
<td>Consumer Protection Act and the Aesthetic Patient</td>
<td>Subodh Sirur</td>
<td>1360</td>
</tr>
<tr>
<td>136.</td>
<td>Challenges in Aesthetic Dermatology: Quackery and Spa Dermatology</td>
<td>Amrendra Kumar, Kavish Chouhan</td>
<td>1364</td>
</tr>
<tr>
<td>137.</td>
<td>Clinical Photography in Surgical and Aesthetic Dermatology</td>
<td>KT Ashique, Feroze Kaliyadan</td>
<td>1369</td>
</tr>
<tr>
<td>138.</td>
<td>Teledermatology in Aesthetic Surgery</td>
<td>Jayakar Thomas, Parimalam Kumar</td>
<td>1379</td>
</tr>
<tr>
<td>139.</td>
<td>Social Media and Aesthetics</td>
<td>Apratim Goel, Masuma Molvi Manasawala</td>
<td>1391</td>
</tr>
<tr>
<td>140.</td>
<td>Abuse of Topical Corticosteroids and the Menace of Fairness Creams</td>
<td>Koushik Lahiri, Arijit Coondoo</td>
<td>1397</td>
</tr>
<tr>
<td>141.</td>
<td>Establishing and Setting up a Dermato-aesthetic Practice and Related Marketing</td>
<td>D Dinesh Kumar</td>
<td>1407</td>
</tr>
<tr>
<td>142.</td>
<td>Documentation and Role of Electronic Medical Records</td>
<td>Pradyumna Vaidya, Vikram Lele</td>
<td>1414</td>
</tr>
<tr>
<td>143A.</td>
<td>Training in Aesthetic Practice</td>
<td>S Sacchidanand, Sujala S Aradhya</td>
<td>1420</td>
</tr>
<tr>
<td>143B.</td>
<td>Training in Dermatosurgical Practice</td>
<td>S Sacchidanand, Sujala S Aradhya</td>
<td>1423</td>
</tr>
<tr>
<td>143C.</td>
<td>International Training in Aesthetic Dermatology and Dermatologic Surgery</td>
<td>Madhulika Mhatre, Venkataram Mysore</td>
<td>1427</td>
</tr>
<tr>
<td>144.</td>
<td>Role of Counselors in Aesthetic Practice</td>
<td>Narendra Gokhale</td>
<td>1430</td>
</tr>
<tr>
<td>145.</td>
<td>Indian Innovations in Dermatosurgery</td>
<td>Sanjeev Gupta, Somesh Gupta</td>
<td>1435</td>
</tr>
<tr>
<td>146.</td>
<td>Suppliers’ Details for Laser Machines, Dermatosurgical and Aesthetic Equipment/Products</td>
<td>Ankur Talwar, Kshama Talwar, Suresh Talwar, Rachita Narad</td>
<td>1444</td>
</tr>
<tr>
<td></td>
<td>Glossary</td>
<td>HM Omprakash</td>
<td>1455</td>
</tr>
<tr>
<td></td>
<td>Index</td>
<td></td>
<td>1459</td>
</tr>
</tbody>
</table>
A bandage is primarily used to hold the dressing in place over a wound to create pressure over a bleeding wound for control of hemorrhage, to provide immobilization after a graft, and to provide support to surgery area. A dermatosurgeon needs to be familiar with different types of bandages, particularly in surgeries such as vitiligo surgery, hair transplantation, liposuction, etc. In particular, surgeries are performed for vitiligo lesions in different parts of the body and need proper immobilization for proper draft take.

Bandaging the wound is an art; the human body parts differ in shape and are capable of a wide range of movements due to joints. Due to variety of shapes and movements, there can be no universal bandaging technique. Following body shapes should be considered while selecting bandaging technique:

- Body shapes with blunt ends such as fingers, hands, forefoot, or head.
- Body parts with a tapered shape such as an arm, leg or trunk, where the circumference of the body part either increases or decreases.
- Joints which allow a hinge movement, such as the knee, elbow and ankle.
- Body parts with an almost constant circumference, such as the midfoot, middle of the hand, ankle and wrist.

**GENERAL PRINCIPLES OF BANDAGING**

- Bandage should be used only to hold in place the dressing which covers a wound.
- It should never be applied directly over a wound.
- A bandage should be applied firmly and fastened securely. It should not be applied so tightly that it stops circulation or so loosely that it allows the dressing to slip.

**BANDAGE TECHNIQUES**

There are four basic techniques with which nearly all parts of the body can be bandaged. These include (A) **triangular** and **cravat bandages**, (B) **roller bandages**, (C) **tailed bandages** and (D) **special bandages**.

**Triangular and Cravat Bandages**

These are easy to apply, quick and stay well. Hence, they are valuable in dermatosurgeries to place temporary bandages till the completion of surgery, e.g. to cover the donor sites in vitiligo surgeries or hair transplantation. A square of sterile gauze material about 3 feet × 3 feet, or slightly more, is folded diagonally. The long side of the triangle is called the ‘base’, the point opposite the base is called the ‘apex’, and the points at each end of the base are called the ‘ends’. This bandage may be used either as a triangle or as a cravat. Cravat (term derived from neck kerchief worn by boy scouts) is made from the triangle by bringing the apex to the base and folding it upon itself a sufficient number of times to obtain the desired width (Fig. 1).

**Triangle of Forehead or Scalp (Fronto-occipital) (Figs. 2A to C)**

This is used to hold dressings on the forehead or scalp.
a. Place middle of base of triangle so that edge is just above the eyebrows and bring apex backward, allowing it to drop over back of head (occiput). Bring ends of triangle backward above ears.
b. Cross ends over apex at occiput, carry ends around forehead, and tie them in a square knot.
c. Turn up apex of bandage toward top of head. Tuck in behind crossed part of bandage.

**Triangle of Chest or Back (Figs. 3A to C)**

This bandage is used to hold dressings on burns or wounds of chest or back.

a. Drop apex of triangle over shoulder on injured side. Bring bandage down over chest (or back) to cover dressing, so that middle of base of bandage is directly below injury. Turn up a cuff at base.
b. Carry ends around and tie in a square knot, leaving one end longer than the other.
c. Bring apex down and tie to long end of first knot.

**Triangle of Shoulder (Figs. 4A to D)**

The triangle of the shoulder is used to hold dressings on wounds of the shoulder. Two bandages are required, one a triangle and the other a cravat or roller bandage.
a. Place center of cravat or roller bandage at base of neck on injured side, and fasten just forward of opposite armpit.
b. Slide apex of open triangle under cravat at base of neck and place over dressing on injured shoulder and upper arm. Turn up cuff at base.
c. Bring ends around arm and tie.
d. Secure apex to cravat at neck by fastening with adhesive tape.

Triangle of Hip (Figs. 5A to C)
The triangle of the hip is used to hold dressings on the buttock or hip. It requires two bandages, one a triangle and the other a cravat or roller bandage.

a. Fasten cravat or roller bandage around waist.
b. Place base of triangle below buttock (gluteofemoral fold) and slide apex under cravat at waist. Fold base upward to form cuff and carry ends of base around thigh.
c. Tie ends of base with square knot. Fasten apex to waist cravat by an adhesive tape.

d. Secure apex to cravat at neck by fastening with adhesive tape.

Triangle of Foot (Figs. 6A to E)
Triangle of foot is used to hold dressings of considerable size on the foot.

a. Center foot upon bandage at right angles to base, with heel well forward of base.
b. Carry apex of triangle over toes to ankle, and tuck excess fullness of bandage into small pleats on each side of foot.
c. Cross each half of bandage toward opposite side of ankle.
d. Bring ends of triangle around ankle.
e. Tie ends in square knot.

Triangle of Hand (Figs. 7A to E)
The triangle of the hand is used to hold dressings of considerable size on the hand.

a. Place middle of base of triangle well up on palmar surface of wrist.
b. Carry apex around ends of fingers. Cover back (dorsum) of hand to wrist and tuck excess fullness of bandage into small pleats on each side of hand.

c. Cross each half of bandage toward opposite side of wrist.

d. Bring ends of triangle around wrist.

e. Tie ends in square knot.

**Cravat of Head (Figs. 8A to C)**

The purpose of this bandage is to apply pressure to control hemorrhage from wounds of lower scalp, e.g. bandaging donor site during hair transplantation.

a. Place middle of cravat over dressing.

b. Pass each end completely around head.

c. Tie in square knot.
Cravat Bandage of Eye (Figs. 9A to D)
The cravat bandage of the eye is used to hold a dressing over the eye, e.g. following ptosis surgery. Two cravats are required.

a. Lay center of first cravat over top of head with the front end falling over uninjured eye.
b. Bring second cravat around head, over eyes and over loose ends of first cravat. Tie in front.
c. Bring ends of first cravat back over top of head, tying there and pulling second cravat up and away from uninjured eye.

Shoulder-Armpit Cravat (Figs. 10A to C)
The shoulder-armpit cravat (bisaxillary) is used to hold dressings in the axilla or on the shoulder.

a. Place cravat over dressing in axilla so the front end is longer than the back. Carry the ends upwards.
b. Bring ends across each other over top of shoulder.
c. Cross ends over back and chest respectively to opposite axilla. Tie ends just in front of uninjured axilla.

Cravat of Elbow (Figs. 11A to C)
The cravat of the elbow is used to hold dressings around the elbow.

a. Bend arm at elbow and place center of cravat at point of elbow (olecranon).
b. Bring ends up and across each other in overlapping spiral turns. Continue one end up arm and the other end down forearm.
c. Bring ends to front of elbow (antecubital fossa) and tie.

Cravat of Knee (Figs. 12A to C)
The cravat of the knee is used to hold dressings around the knee.

a. Place center of cravat over knee cap and let ends hang down each side of knee.
b. Cross ends underneath and continue several overlapping descending turns down calf and several overlapping ascending turns up thigh.
c. Bring ends together and tie under knee.
**Cravat of Leg (Figs. 13A to C)**

The cravat of the leg is used to hold dressings on the leg, e.g. in leg ulcers

a. Place center of cravat over dressing.
b. Begin ascending turns with upper end and descending turns with lower end, with each turn covering two-thirds of preceding turn until dressing is covered.
c. Terminate by tying both ends in square knot.

**Cravat of Palms (Figs. 14A to F)**

This bandage is used to hold dressings on the palm.
a. Lay center of cravat over center of palm with ends hanging down each side.
b. Bring the thumb end across back of hand, over palm and through hollow between thumb and palm.
c. Bring the other end across back of hand, toward base of thumb and obliquely across palm to base of little finger.
d. Cross both ends at back of hand.
e. Continue procedure, ends crossing first at back of hand and then over palm.
f. Tie in square knot at wrist.

Figs. 12A to C: Cravat of knee bandage.

Figs. 13A to C: Cravat bandage of leg.

Figs. 14A to F: Cravat bandage of palm.
Roller Bandages

The roller bandages are used to hold dressings in place, to support surgery site and to create pressure for control of hemorrhage. Roller bandages are made from gauze, flannel, muslin, rubber or elastic webbing, the width and length depending upon the part to be bandaged.

Sizes Recommended (Fig. 15)

The sizes most frequently used are 2 inches width and 6 yards long for hand, finger, toe and head bandages; 3 inches wide and 10 yards long for extremities; and 4 inches wide and 10 yards long for thigh, groin, and trunk.

For convenience and ease of application, the strip of material is rolled into the form of a cylinder. Each bandage of this type should consist of only one piece, free from wrinkles, seams, selvage and any imperfections that may cause discomfort to the patient.

Applying the Roller Bandage

When a roller bandage is to be applied to a part, the roll should be held in the right hand so that the loose end is on the bottom.

The outside surface of the loose end is next applied to the part and held there with the left hand. The roll is then passed around the part by the right hand, which controls the tension and direction of the bandage. Two or three of the initial turns of a roller bandage should overlie each other to secure the bandage. In applying the bandage, it is often necessary to transfer the roll from one hand to the other.

Precautions to be taken while applying roller bandages:

- Roller bandages should be applied evenly, firmly and not too tightly. Excessive or uneven pressure will interfere with the circulation.
- In bandaging an arm or leg, the entire extremity (except the fingers or toes) should be covered to maintain uniform pressure. The fingers or toes should be left exposed so the circulation in these parts can be checked.
- An extremity should be bandaged in its final position, since bending will change the pressure of parts of the bandage.
- It is safer to use a large number of turns rather than a few too firmly applied turns to secure splints or dressings. This is particularly important in applying a wet bandage, or one that may become wet while securing a wet dressing.
- Bandage turns should overlap to completely cover the skin, since any uncovered skin may be pinched between turns. To prevent chafing and irritation when two parts are bandaged together, skin surfaces should be separated by absorbent material.

Fastening the Bandage

Bandages are terminated by applying several overlying circular turns and fastening the ends securely. The ends may be tied or fastened with adhesive tape. Two methods of tying are (Figs. 16A to C):

a. The end of the bandage is folded back upon itself to form two ends which can be tied.

b. The end of the bandage is split lengthwise for a suitable distance and the split ends are then brought around in opposite directions and tied.

c. The square knot is the best type of knot for tying bandages. It holds firmly and can be easily unfastened.

Removing the Bandage

Bandage scissors are preferable when the bandage is to be removed by cutting. Interference with the underlying dressing and wound should be carefully avoided. Folds should be gathered up when the bandage is merely unwound.

Types of Roller Bandages Based on Site of Application

Circular Bandage (Fig. 17)

A circular bandage is used to cover cylindrical parts and to anchor bandages. As illustrated in Figure 17, a turn is made around the part and anchored. Similar succeeding turns are made, overlying each other completely. The bandage is then terminated and secured.

Spiral Bandage (Figs. 18A to C)

Spiral bandage covers a larger area than that covered by the circular bandage. It can be applied to the arm as well as to other cylindrical parts.

a. Anchor at wrist.

b. Apply succeeding spiral turns up the forearm, with each turn overlapping one-third of preceding turn.

c. Terminate and secure just below elbow.

Recurrent Bandage of Head with One Bandage (Figs. 19A to D)

This bandage is used to hold a dressing on the scalp.

a. Anchor bandage with several turns around the head, terminating behind head. At this point fold bandage upward, with assistant holding fold in place with two fingers.
Circular Bandage

b. Continue bandage over top of head to center of forehead. Fold bandage back at this point and hold it there with free hand. Carry bandage back to point held by assistant at rear of head.
c. Continue procedure until entire head is covered, turns alternating to the left and right of the center line and each turn overlying the outer half of the preceding turn.
d. Apply several circular turns around head, covering the ends of the initial turns, and secure.

Shoulder Bandage (Figs. 20A to D)

Shoulder bandage is used to retain dressings of the shoulder and axilla, e.g., following surgery for hidradenitis suppurativa.
a. Pad the axilla well and anchor by several circular turns around upper arm where surgery is performed.
b. Carry across back to axilla of opposite side; then across chest obliquely to top of primary turns.
c. Carry around arm, axilla, and upward toward shoulder. Repeat procedure, each turn overlying about two-thirds of preceding turn.

d. Continue until entire shoulder is covered. The line crossings on the shoulder be straight and should pass over the point of the shoulder. Secure with adhesive tape.

**Figure of Eight Bandage for Hand (Fig. 21)**

This bandage is used to hold dressings on dorsum of hand or palm, e.g. flap rotation or tendon transfer.

a. Anchor bandage on hand with circular turns near ends of fingers. Carry obliquely across back of hand to thumb. Bring under thumb and across palm to back of hand.

b. Carry obliquely across back of hand to bottom of primary turn and across palm.

c. Follow with several similar turns, each one overlying about two-thirds of preceding turn on back of hand. After sufficient turns, terminate with circular turns around wrist and secure.

Fig. 21: Figure of eight bandage of hand.
Figure of Eight Bandage for Elbow  
(Figs. 22A to D)
This bandage is used to hold a dressing in the antecubital fossa.

a. Anchor with circular turn above elbow and carry bandage obliquely downward over hollow of elbow.
b. Circle forearm below elbow to anchor, bring obliquely upward over hollow of elbow and pass around upper arm at primary circle.
c. Repeat procedure with oblique turns progressing up forearm, each turn overlapping preceding turn by two-thirds.
d. Terminate at starting point and secure.

Front of Elbow Bandage (Fig. 23)
This bandage is also used to hold dressings on the antecubital fossa. Unlike the figure of eight of the elbow, this bandage leaves back of elbow exposed. It allows movement of joint without disturbing the dressing. Anchor bandage with circular turns around forearm below elbow. Carry bandage obliquely upward over hollow of elbow, and circle arm just above elbow. Bring obliquely downward over hollow of elbow and pass around forearm at primary circle. Repeat procedure until hollow of elbow is covered, each oblique turn overlapping preceding oblique by three-fourths and each circular turn overlapping each preceding circular turn. Terminate at circular turns above elbow, and secure.

Finger Bandage (Figs. 24A to C)
The finger bandage secures dressing on finger.

a. Anchor bandage at wrist. Bring over back of hand and make one complete turn at base of injured finger over dressing. Make spiral turn to tip of finger to hold dressing while applying bandage.

b. Make another spiral turn back to base of finger.
c. Complete bandage with figure of eight, progressing from tip to finger base. Terminate with circular turns around wrist and secure.

Foot Roller Bandage (Figs. 25A to D)
The foot roller bandage is used to hold dressings on foot, e.g. plantar ulcers or following flap rotation.

a. Anchor around foot near base of toes. Carry obliquely across instep and around heel. Continue obliquely across instep, crossing preceding turn to base of large toe.
b. Repeat procedure, turns gradually ascending on both foot and heel, crossings being in line along middle of instep.

c. Continue procedure in above step.

d. Terminate above ankle and secure.

**Figure of Eight Bandage of Foot (with Heel Exposed) (Figs. 26A to C)**

This bandage is used to hold dressings on foot, e.g. plantar ulcers, flap rotation or melanoma excision.

a. Anchor just above ankle, bring bandage obliquely across instep to base of large toe, with turn around base of toes.

b. Continue obliquely across instep to point of beginning.

c. Repeat procedure, leaving heel exposed, with turns ascending until arch and instep are covered. Terminate at starting point and secure.

**Tailed Bandages**

Tailed bandages consist of the T-bandage, the double T-bandage, the four-tailed bandage and the many-tailed bandages (Figs. 27A to D). These bandages are used to secure dressings to parts which do not lend themselves to roller bandage applications.

a. The T-bandage is a T-shape bandage consisting of a vertical strip of material sewn or pinned to the center of a horizontal strip. This bandage may be used to secure dressing on scalp, ear, eye or perineum.

b. The double T-bandage may be made by sewing two vertical strips of material to the center of a horizontal strip and about 4 inches apart. The double T-bandage may be used to hold dressings on the chest, back or perineum, e.g. scrotal surgery, vitiligo grafts.

c. The four-tailed bandage is a piece of material 4–6 inches wide and about 30 inches long with each end cut about 12 or 14 inches down its middle, leaving the center piece about 12 or 14 inches in length. The four-tailed bandage is used to hold dressings on the jaw, nose, forehead, and the back of the head.
The many-tailed bandage is similar in construction to the four-tailed bandage, except that the ends are cut into the desired number of tails about 16 inches in length and the uncut portion is about 20 inches in length.

Four-Tailed Bandage of the Nose (Figs. 28A and B)

This bandage is used for holding a dressing following any surgery performed around the nose. A four-tailed bandage of the desired length and width is used.

a. Split the bandage lengthwise from each end to within 3 or 5 inches of the center of the strip.
b. Place the top of the center over nose, carry the two upper ends under ears and around to nape of neck and tie.
c. Fold the bottom of the center under nose, carry the two lower ends above ears to top of head and tie.

Special Bandages—Compression Bandaging

These reduce effect of venous hypertension by reducing superficial venous pressure. They increase the rate of wound healing, especially if multilayered. The optimal pressures are 35–40 mm Hg and it is essential not to deliver such high levels of pressure to an ischemic leg, as it may result in necrosis or gangrene. Doppler pressures should always be measured and compression dressings only used if the ankle brachial pressure index is greater than 0.8. Traditional crepe bandages do not provide adequate compression. Newer short stretch high performance bandages are more effective in this regard. Combining compression therapy with surgery to correct superficial venous reflux does not lead to improved healing rates compared with compression alone, but reduces ulcer recurrence and increases ulcer-free time. Table 1 shows different types of compression bandages and their indications.

Further details can be found in chapter 54 (Leg Ulcers).

RECOMMENDED READING

Chapter 81

Lip Augmentation

Malavika Kohli, Swati Mutha, Banani Choudhury

Key Messages
- Lips are the most defining feature of the face; lip augmentation is a commonly done procedure in aesthetic clinics.
- Aesthetic treatment of the lips has changed from localized structural approach to more of a regional treatment approach.
- Assessment is an essential part of treatment. It also helps in the choice, placement and quantity of product to create natural (naturally looking) beautiful lips.
- Biodegradable hyaluronic acid-based fillers are most commonly used because of their safety and widespread acceptance.

INTRODUCTION
Lips are one of the most visible of all human organs and perhaps the most emotionally expressive part of the human body, so it is hardly surprising that lip enhancement has become so popular. Soft and pliable, they are also multifunctional, providing an opening for food and beverage consumption, an instrument of both verbal and nonverbal communication, a tactile sensory organ and an erogenous zone.

DEFINITION
Lips are the upper or the lower fleshy margin of the mouth, consisting of two mucous folds, each with an outer mucosa with a stratified squamous epithelial surface layer.

BASIC FEATURES OF LIPS (FIG. 1)
- **Vermilion border**: The red margin of the upper and lower lip, which commences at the exterior edge of the intraoral labial mucosa (moist line) and extends outward, terminating at the extraoral labial cutaneous junction; a thinly keratinized type of stratified squamous epithelium deeply penetrated by well-vascularized dermal papillae that show through the translucent epidermis to impart the typical red appearance of the lips.
- **Vermilion**: Red or pink surface of upper and lower lip.
- **Labial or oral commissure**: It is the junction of upper and lower lips lateral to mouth angle.
- **Cupid's bow**: The contour of the superior margin of the upper lip.
- **Philtrum**: The vertical groove in the midline of the upper lip, extending downward from the nasal septum to the tubercle of the upper lip.
- **Philtral column**: These are the margins that surround the philtrum.
- **Labiomental crease**: The horizontal depression between the lower lip and the chin.

HISTORICAL BACKGROUND
Women of all ethnic and social backgrounds have applied cosmetics to their lips to define or alter their appearance since the Stone Age. Tribal ceremonies involving the introduction of various materials in the upper and lower lip to alter their shape, usually with the intent to enlarge them, have been practiced in African tribes for centuries.

Rosy lips were desirable, and botanically derived stains like crushed rose petals were used for their pink color. History of Indian lips is given in Table 1.

ANATOMY
Lips are soft pliable anatomical structures that form the oral margin of most vertebrates. They are composed of a
Fig. 1: Basic features of lips: Diagrammatic presentation.

**Table 1: Indian lips history.**

<table>
<thead>
<tr>
<th>Era</th>
<th>Lip trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancient India, 900 AD</td>
<td>Trend was luscious rosebud lips</td>
</tr>
<tr>
<td>Radiant beauty of 60s and 70s</td>
<td>Lips were not a separate entity but were seen holistically with face</td>
</tr>
<tr>
<td>Glorious smile of 80s and 90s</td>
<td>At this time, smile was the attractive part, with beautiful lips being the nonseparable entity</td>
</tr>
<tr>
<td>India and worldwide, 2000s:</td>
<td>The ideal of beauty in the 2000s: In last one and half decade, fuller luscious lips became a singular feature of beauty, especially, upper lip is the current preference and most frequently asked for. Indian women avoid over enhanced lips; instead, they express the desire for natural looking refreshed hydrated lips</td>
</tr>
</tbody>
</table>

Fig. 2: Veins of the face: Course of facial vein and its anastomosis.

Fig. 3: Arteries of face: Facial artery and its branches supplying the perioral area.

Flowchart 1: Blood supply.

Blood supply (through arteries and veins) to the lips has been shown in Figures 2 and 3. Flowchart 1 also describes blood supply of the lips.

Besides supplying the nutrients, blood supply also impacts the lip color. For example, in fair skin, which contains no melanocyte, the underlying blood vessels appear through the skin on the lips. Hence, the lips look pink or red.
In the case of darker skin, which contains more melanin and is visually thicker, the effect is less prominent.

Lymphatic Drainage (Lips and Perioral Region)\textsuperscript{1,2}

Lymphatic drainage from the upper lip is unilateral except for the midline. The lymphatics coalesce to form five primary trunks that mainly lead to the ipsilateral submandibular nodes, with some drainage also going to the periparotid lymph nodes. Occasionally, some drainage may occur to the ipsilateral submental lymph nodes. The lower lip lymphatics also coalesce to form five primary trunks that lead to bilateral submental nodes from the central lip and unilateral submandibular lymph nodes from the lateral lip (Figs. 4 and 5).

Nerve Supply

Lips are packed with nerve endings. Besides making them a highly erogenous zone, it is also extremely sensitive when treating them with injectables.

Motor Nerve

The motor innervation to the perioral musculature uniformly is from the seventh cranial nerve (the facial nerve). The facial nerve has temporal, zygomatic, buccal, marginal mandibular, and cervical branches. The buccal and marginal branches primarily supply innervation to the perioral musculature.

Muscle Insertion of Lip

A structure called the modiolus is essential to understand the insertions of the lip musculature. The modiolus is a tendinous thickening at each commissure that serves as an attachment site for several of the upper and lower lip muscles (Fig. 6).\textsuperscript{3}

LIP AUGMENTATION

Ideal Lips

The ideal lips have the following properties (Fig. 7):\textsuperscript{4}

- Well-defined philtral columns
- A beautifully shaped Cupid’s bow
- Distinct lip edges
- Oral commissures or corners that are neutral or slightly turned up
- Fullness in certain key areas, as indicated by the “+” in Figure 7
- Areas of fullness in the lower lip balanced by deficiencies in the upper lip and vice versa.

Types of Lips

- Young lips: Lips are at a relatively short distance from the base of the nose to the upper vermilion with a distinct vermilion border or “white roll”. Good amount of upper tooth shows (4–5 mm) when the upper and lower lips are parted in repose. In young lips, thickness of the lower lip in its central half is 2–3 times the thickness of its upper counterpart. The width of the mouth, as measured from corner to corner, is no more than twice the width of the nostril span (Figs. 8 and 9).
- Dehydrated lips: Dryness appears along with flaking and chapping. Scales are also there on lips, in extreme cases, there may also be soreness (Fig. 10).
- Deflated lips: Deflated lips have thin vermilion, ill-defined border and/or perioral wrinkles (Fig. 11).
Table 2: Perioral muscles.

<table>
<thead>
<tr>
<th>Lip elevators</th>
<th>Lip depressors</th>
<th>Accessory muscles</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Levator labii superioris</td>
<td>• Depressor labii inferioris</td>
<td>• Platysma</td>
</tr>
<tr>
<td>• Alaeque nasi</td>
<td>• Orbicularis oris</td>
<td>• Risorius</td>
</tr>
<tr>
<td>• Levator labii superioris</td>
<td>• Mentalis</td>
<td>• Masseter</td>
</tr>
<tr>
<td>• Zygomaticus major and minor</td>
<td>• Depressor anguli oris</td>
<td></td>
</tr>
<tr>
<td>• Levator anguli oris</td>
<td>• Mentalis</td>
<td></td>
</tr>
</tbody>
</table>

- Dilates nostril and elevates upper lip
- Elevates and everts upper lip
- Elevates and draws angle of mouth laterally
- Elevates and everts upper lip
- Elevates angle of mouth
- Depresses and draws lower lip laterally
- Depresses and draws angle of mouth laterally
- Depresses and everts upper lip
- Elevates and wrinkles skin of chin and protrudes lower lip
- Narrows orifice of mouth, purses lips and puckers lip edges
- Retracts angle of mouth
- Elevates mandible (enables forced closure of mouth)
- Depresses and wrinkles skin of lower face and mouth. Aids forced depression of mandible

Fig. 7: Ideal lips.

- Aging lips: As the lips age, the upper lip flattens and lengthens, philtrum flattens and lengthens, Cupid’s bow effaces, and the vermilion thins, leaving a flat, thin profile. The vertical rhytides deepen and appear, the corners of the mouth droops with gravity and volume loss, and the nasolabial folds deepen. All of these changes result in a sad, tired look (Fig. 12).

Current Trends in Lip Augmentation

Lip augmentation procedure is more popular than ever these days. Inspiration is drawn from celebrities having the perfect set of lips. This is becoming more popular in women. Young patients are more sure of what they want from lip augmentation procedure. Women of older age are a bit anxious, less confident and unsure of the outcomes.

Relative Contraindications

Contraindications of lip augmentation are given in Box 1.

Patient Selection: Assessment of a Patient for Lip Augmentation

After ruling out the contraindications, patient selection is done according to:
1. Patient’s desire.
2. Physician assessment.
**Patient’s Desire**

It usually depends on the age of the patient—young or old.

- Young patients are usually sure of what they want. Their areas of concern are as follows:
  - Upper lip enhancement
  - Lip border eversion
  - Cupid’s bow enhancement.
- Old patients want to get rid of sad or tired look but desire natural or fresh look. Their areas of concern are as follows:
  - Vermilion border and vermilion
  - Angle of mouth
  - Marionette lines
  - Perioral aging.

**Physicians’ Assessment**

Patient should be assessed in natural sitting position in a well-lit room. Ideal position of face for assessment is further given.

---

**Box 1: Relative contraindications.**

*To be handled with caution:*

- Patient with history of allergies
- Patient with history of uncontrolled diabetes
- History of connective tissue disorder or poor scarring
- Patient having lupus erythematosus, some products may cause flare ups of lupus
- Patient with blood clotting disorders
- Patient with poor dental health, especially dental abscess/excessive plaque
- History of oral herpes or active herpes
- Person suffering from nerve disorders of the face
- Person with any active diseases that can affect the outcome or increase the risks of lip augmentation including heart disease or asthma
Front View (Fig. 13):  
- **Medial canthus in line with nostrils and lip projection:** This does not happen in the image on left side.  
- **Angle of mouth in line with the medial limbus:** This does not happen in the image on left side check image again.

Profile View (Figs. 14A and B):  
- **Riedel plane:** It is a line drawn tangentially through the anterior points of the lips.  
- **In women anterior projection of the chin should be slightly behind or just at the Riedel plane.** Line in photo is behind chin projection not the same as schematic diagram (Figs. 14A and B).

**Lips Examination**  
Examine lips while relaxed and during animation in order to assess the following:  
- **Border:** should be clearly defined and minimally everted.  
- **Projection:** Maximal projection should be in the middle of the lip, which gently graduates to the medial portion of the lip and slopes laterally to the angle of the mouth.  
- **Volume:** Should be in proportion to the face size, e.g. enlarged, full lips in a very petite face will not be esthetically pleasing as this would be disproportionate.  
- **Proportions or ratio:** Upper lip (UL): lower lip (LL) (1:1.6).  
- **Symmetry:** Look for any deviation from midline or prognathic or retrognathic maxilla, muscle hypo- or hyperactivity.  
- **Perioral aging.**  
- **Dental evaluation:** Do a detailed dental evaluation and a dental reference, if necessary, in cases like malalignment or gingival show, etc.  
- **Muscle assessment:** Assess muscle activity around the lips as it can contribute to asymmetry and assessment for with botulinum toxin A, if required, in case of hyperactive muscles.  
- **Smile evaluation:** **Gummy smile** (Fig. 15): The appearance of a person’s mouth when smiling in which their teeth appear abnormally small, due to either a high lip line (hypermobile lip), hyperplasia of the gums,
which can occur in response to certain medications, e.g. phenytoin, or smaller than normal teeth due to developmental events, tooth eruption abnormalities, orthodontic treatments and even congenital defects.

Options Available

Different options are available for lip regeneration and augmentation, which include the following:

- **Fillers:**
  - Temporary: Hyaluronic acid (HA)-based (6–9 months) and autologous stem cell fat transfer (average 5 years).
  - Permanent: Polycrylamide, polymethylmethacrylate (PMMA), collagen, Artecoll,® silicon.
- **Machine based:** Lasers like 1064, Q switched Nd: YAG, ablative including fractionated laser.
- **Platelet-rich plasma (PRP) therapy.
- **Surgical implants:** Artecoll® (Canderm Pharma Inc., Canada) and Gore-Tex™.

Out of these options available, HA-based fillers are most commonly used and preferred for lip augmentation because of the following reasons:

- They are safe, have less chance of complications and least hypersensitivity reactions.
- Hyaluronic acid-based fillers are reversible with hyaluronidase.
- Hyaluronic acid-fillers can be used for all parts of the lip allowing for very controlled and predictable results.
- They ease the use.
- They have widespread acceptance.

Strategic positioning helps in esthetically pleasing results, recreating the same results next time. Many brands are available in the market with different proportions of HA. The methodology used to cross link light and heavy chain of hyaluronic acid determine the G-prime of the product, its viscosity, gel hardness and lifting capacity which further determine the depth of the product placement. Hence, the choice of proper product and its correct placement will ensure the best esthetic results as well as its longevity.

Procedure

**Preparation**

- **Tray setting:** Keep emergency tray ready with atropine, adrenaline and reconstituted hylase in case of vascular occlusion, nitroglycerine ointment.
- **Procedure room setting:** The room should be well-lit and preferable patients placed facing the light source.
- **Patient preparation:** Patient should be sitting in semireclined position with head supported. Patient is cleansed using betadine solution and spirit gauze.
- **Preoperative photographs:** Photographs to be taken in front and profile view (45° and 90°).
- **Patient consent:** Written informed consent with all the procedural details to be signed by the patient.

**INJECTION TECHNIQUES FOR THE LIP REGION**

For injection purpose, lip can be divided into the following areas:

- Lip border
- Vermilion
- Oral commissures
- Cupid’s bow or philtrum.

**Lip Border**

- Inject in a linear pattern using 1–2 injection sites per quadrant with 0.1–0.2 mL HA filler per quadrant (Figs. 16 to 18).
- Medium to heavy weight product to be injected using 27 G ½” needle.
Light weight to be injected using 30 G ½" needle (Figs. 19A to C).

**Technical Tips**
- Avoid the labial artery and vein in the intraoral submucosal plane
- When needle is placed in the correct plane, the product flow should be retrograde
- Remain superficial
- When border definition is poor, in case of older patients, product should be placed into the border
- When border enhancement is desired, in case of young patients, product to be placed just medial to the border which will help in eversion of border and avoid accentuation of white roll.

**Tips**
- Inject at the junction of wet and dry portion of the lip, stay in the submucosal plane, neither the needle nor the needle outline should be visible.
- Avoid the labial artery and vein in the intraoral submucosal plane
- Inject very slowly specially if using a heavier HA product, to avoid lumpiness
- This is a sensitive area; potential for bruising is high.
Inject very slowly and smoothly.
Avoid inadvertent displacement of the product which may then appear irregular, bumpy or beaded.

Vermilion
- Linear: Inject in a linear fashion either anterograde or retrograde, choose one site per quadrant using total 0.5–1.0 mL HA filler for both lips.
- Medium to high molecular weight (MW) to be injected using 27 G ½” needle
- Low MW to be injected using 30 G ½” needle.

Bolus Technique 2
Choose three injection sites per quadrant and put a small bolus (<0.05 mL/Bolus), with a total of 0.5–1.0 mL of HA for both lips (Fig. 20).

Oral Commissures (Figs. 21A to C)
- Inject slowly and observe volume guidelines
- Give 0.05–0.1 mL bolus, into the oral commissure. Additionally, threading along the upper and lower border may be required for perioral support of the commissure.

Warning: Stay within 1 cm of the oral commissure to avoid inadvertent placement of product or puncturing of labial artery to avoid a bad bruise or vascular accident.

Cupid’s Bow/Kissing Tubercles/Philtrum (Figs. 22A to C)
A very gentle accentuation of the Cupid’s bow is desirable without over projection. This can be achieved by placing miniscule amounts in a linear fashion just at the border.

Philtrum column: To be enhanced only if absolutely necessary. In case of ill-defined pre-existing column, accentuation can be achieved by injecting few drops of the filler at exact high point of Cupid’s bow where philtrum column descends and ends.

Hyaluronic Acid Filler with Lidocaine 0.03%
This product is used to maximize the anesthetic benefit provided by newer HA which has lidocaine 0.03% incorporated. With the linear method, as you enter, a few drops of the product are introduced to immediately initiate the anesthetic effect of lidocaine and reduce the patients discomfort and as the needle is passed upwards,
small amount of product is injected in antegrade fashion. This is followed by the retrograde threading with the desired amount of product deposition. It reduces pain and discomfort by 80%. Necessity of a dental block has been greatly reduced with these fillers. For those who are very pain sensitive, a topical lidocaine/prilocaine anesthetic cream can be applied 30 minutes prior.

LIP AUGMENTATION AND MEN

One should always keep in mind following points when performing lip augmentation procedure in males:
- Do not upturn the corners of lips
- Do not inject complete lips
- Keep the balance of upper lip and lower lip
- Use less product. Avoid projection of lips
- Do not touch the Cupid’s bow or philtrum.

Postinjection
- Adequate icing of the injected area
- Antibiotic cream application
- Vitamin K cream
- Gentle massage, only if required.

Instruction to the Patient

Instructions for the patients are given in Box 2.

COMPLICATIONS

Hyaluronic acid filler related or procedure related immediate and long-term complications may occur as mentioned here.

Short Term/Immediate
- Swelling: Multiple injections and handling, usually resolves in 2–3 days.
- Bruise: Unpredictable, fairly common. Chances of bruising can be reduced by taking detailed history and refining injection technique.
- Infection: Aseptic precautions and local antibiotic postinjection can reduce the chance. If occurs, then oral antibiotic may be needed.

Box 2: Instructions for the patients.
- Plenty of fluids or water
- No kissing for 48 hours
- No pressing or massaging of lips
- Avoid too much of lip movement
- Postinjection meal preferable with a straw
- Swelling postinjection is fairly common, may take an anti-inflammatory, if required
- Avoid lip gloss or lip stick for 12 hours
- Avoid soaps or facial cleansers for first 2 days
- Minimize contact between the lips and water for a day

- Asymmetry: Can be due to swelling, counsel the patient to give 7–15 days for inflammation to settle.
- Vascular occlusion: Blanching.

Late
- Lump/nodule: Lumps and nodules may occur which may not be visible but patient may feel it. Mostly lumps resolve in few weeks but, if not, they may have to be dissolved with hyaluronidase.
- Long-term lumps/nodules (delayed inflammatory reaction) with both HA and non-HA filler can occur and may require dissolution through repeated hyaluronidase or extraction through laser or surgery.
- Asymmetry: It can be corrected by adding or dissolving the filler.

AUTHORS EXPERIENCE/TECHNIQUE/TIPS

Case 1 (Figs. 23A and B)

Patient wanted natural fresh look, did not want to enhance volume. Also patient refused to do botulinum toxin (because she is singer) in depressor anguli oris (DAO) which would have enhanced the effect of filler into the oral commissure.
Our opinion: On assessing, lips have good volume, patient needs hydration of lips, angles of mouth, and border correction.

1 cc of low molecular weight (LMW) filler was used to correct the border, angles, and vermilion, in older individuals, better to keep angles of mouth in neutral position rather than upturned which may look unnatural.

**Case 2: Perioral/Lip Rejuvenation (Cannula) (Figs. 24A and B)**

A 60-year-old patient, dehydrated with marked perioral aging (barcode lines):

- **Assessment:** UL:LL ratio is adequate
- **Upper lip:** Border inadequate and volume is less
- **Asymmetry**
- **Projection:** Incorrect.

**Correction:** Upper lip was enhanced to complement lower lip which was adequate. A light weight HA filler with cannula (30 G) was used. To define the vermilion border and vermilion, 0.4 cc of product was used to define the vermilion border, and vermilion. Hydration can be achieved by putting tiny droplets with cannula with no bruising and minimal downtime. Cannula was used for this patient as she could not afford any downtime.

**Case 3: Angle of Mouth (Advanced Case) (Figs. 25A and B)**

A 55-year-old female with voluminous lips, patient wants angle correction:

- **Assessment:** Very deep nasolabial folds resulting from mid face volume loss, deep marionette lines resulting from lower face volume loss.
- **Correction:** Lips were not touched.
Replaced the volume loss which supported perioral tissue by injecting total 8 cc sequentially in mid-face, nasolabials, and marionette in three sessions over 9 months, improved the angle of mouth and over all lip enhancement.

Case 4: Asymmetry

Right-sided muscle hyperactivity over a period of time.

Plan of action: First treat with botulinum toxin in levator labii superioris and depressor anguli oris, once muscle relaxes, over subsequent sessions, reassess; filler may be considered for remaining asymmetry (Fig. 26).

Case 5: Upper Lip Augmentation (Needle)

Young patient for lip augmentation.

Correction: 0.8 cc light weight filler was used for the following:
- Eversion of upper lip border
- Projection of vermilion
- Enhancement of Cupid’s bow/philtrum/kissing tubercles (Figs. 27A and B).

Case 6: Creating Ideal Lip Proportions

Patient wanted a glamorous/sensuous look: (UL:LL = 1:1) and upper lip should project 1–2 mm beyond lower lip:
- Plan of action: Lower lip was not touched.
- Upper lip: Vermilion 1 cc in first session and 1 cc in second session (3 month later).
- Angle of mouth: 0.1 mL on each side bolus (Figs. 28A and B).

Case 7: Over the Top

Patient desired over inflated lips.

1.5 cc of medium weight filler was used in this patient (Figs. 29A and B).

Case 8: Young Lips Filling with Cannula

Light hydrating filler was used for lip rejuvenation and hydration.

Why was a cannula used? To deliver controlled small amount in the lip body, as lips are already full and the patient did not want any downtime. It helped to improve the color of lips (Figs. 30A and B).

Case 9: Hyaluronic Acid Nodule

These appear as cystic, sclerotic or edematous well-defined palpable lesions which occur either from infections in
Figs. 27A and B: Young patient desiring luscious lips: (A) Before; (B) After (Immediate post: no bruise).

Figs. 28A and B: Young patient desiring glamorous lips: (A) Before; (B) After.

Figs. 29A and B: Over the top lips: (A) Before; (B) After.
Figs. 30A and B: Lip rejuvenation with a hydrating filler: (A) Before; (B) After.

Figs. 31A to F: Hyaluronic acid nodule: (A) Before; (B) Immediately after; (C) After 6 months; (D) Indicating the nodule; (E and F) Extraction of hyaluronic acid lump.

**PEARLS**

- Indian lips are prone to be darker. Causes are as follows:
  - Lip smacking
  - Nutritional
  - Smoking
  - Dry/dehydration.
- Patients, especially Indians, seek options for improving color
  - Change of habits
  - Actinic
  - Ultraviolet protection
  - Lightening agents
  - HA fillers provide excellent and instant option in giving pinker/fresher/hydrated lips. In case of fullness, a light HA product can be used.
- HA filler with lidocaine is the preferred choice. Technique has been discussed earlier. It reduces pain and discomfort by 80%. Necessity of a dental block has been greatly reduced with these filler. For those who are very pain sensitive, a topical lidocaine/prilocaine anesthetic cream can be applied 30 minutes prior.
- Sterile ice packs application pre- and postinjection helps to alleviate pain and swelling and reduce chance of bruising.
- **Topical anesthesia:** Authors have found too thick or prolonged application of topical cream does not give additional anesthetic benefit. So, we prefer to apply a thin layer with a cling film and reapply in 15 minutes. Extra cream may give pseudohydration effect.
- Mapping the amount of product in specific area gives good result.

**REFERENCES**


areas of this soft tissue coverage or superficial injections (Figs. 31A to F).

**Management:** In this case, a simple puncture (incision and drainage) was done to extract the filler.