Bedside Clinics in Surgery

Long and Short Cases, Surgical Problems, X-rays
Surgical Pathology, Preoperative Preparations
Minor Surgical Procedures, Instruments
Operative Surgery and Surgical Anatomy

Makhan Lal Saha
MBBS MS (Surgery) FMAS FAIS
Professor
Department of General Surgery
IPGME & R/SSKM Hospital, Kolkata, West Bengal, India

Formerly, Associate Professor
Department of General Surgery, Calcutta Medical College
North Bengal Medical College

Forewords
Bhabatosh Biswas
N Chintamani
Manoj Kumar Bhattacharya

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Dedicated to
My late parents Madhusudan Saha and Pushpa Rani Saha,
my revered uncle Shri Jadulal Saha
and my teachers
for whom what I am today.
Foreword to the Third Edition

It is a matter of great pleasure and honor for me to write the ‘Foreword’ for the third edition of the *Bedside Clinics in Surgery* authored by Professor Makhan Lal Saha.

In this context, I have no hesitation to declare this “Volume” as a perfect blend of hard core clinical practice along with profound knowledge and vast experience of the author.

Translation of knowledge to clinical practice has always been a great challenge, and Professor Saha has been successful in showing the perfect roadmap to face the challenge for the surgical trainees.

Professor Makhan Lal Saha is known to me since his student days, as serious learner, committed surgeon and passionate teacher. His vast teaching experience has been clearly reflected in selection of “Contents” of this book with 23 chapters of great surgical importance.

I am sure, this volume would prove immensely beneficial for the surgical students and trainees of all the programs including MBBS, MS, Nursing, AYUSH as well as other health science courses.

Here I would like to recommend this edition, not only for undergraduate and postgraduate medical students but also for surgical teachers and trainers.

Prof (Dr) Bhabatosh Biswas

MS DNB MCh (Cardiothoracic Surgery) FRCS
LLB LLM MBA MSW MA (Education)

Formerly Vice-Chancellor, The West Bengal University of Health Sciences, Kolkata
Formerly Vice-President, National Board of Examinations (NBE), New Delhi
Past President, Indian Association of Cardiothoracic Surgeons
Editor (Thoracic Surgery), Asian Cardiovascular and Thoracic Annals
Member of Academic Council of NIMHANS, Bengaluru
Visiting Professor, Indira Gandhi Institute of Medical Science, Patna
Formerly Head, Department of Cardiothoracic and Vascular Surgery, RG Kar Medical College, Kolkata
"He who loves his work never labors."
—Jim Stovall

It gives me great pleasure and joy to write a foreword for this extraordinary book on *Bedside Clinics in Surgery* the second edition by Dr Makhan Lal Saha published by M/s Jaypee Brothers Medical Publishers (P) Ltd, New Delhi, India. The book is a classic example of how to make reading exhaustive yet lucid and enjoyable.

I have known the author for more than a decade and I can vouch for his dedication and keen interest in the teaching of the science and art of surgery. Having authored a few books myself, I am sure that any book is a true reflection of the author’s love for the subject, his readers and students and it is clearly palpable in this book. Dr Saha’s exceptional way of narrating the text makes this book a masterpiece for bedside learning of surgery.

Like in the first edition, the very simple way of teaching even the complex aspects of surgery has its impact on the reader. The litmus test for any book on bedside clinics is the utility during various undergraduate and postgraduate examinations. The book is surely going to pass that test with flying colors as it is a wonderful blend of all the essential aspects of performance in the examinations and in real-life scenario as a doctor.

The mandatory aspect of learning of surgery involves a thorough understanding of the surgical anatomy. The addition of various essential aspects of surgical anatomy with very easily discernible pictures adds tremendous value to this book. There are very limited texts available that address the issue of surgical anatomy of relevant regions.

A picture is worth a thousand words and the presentation of various clinical scenarios with real-life clinical pictures is truly remarkable. The demonstration of bedside physical signs and performance of certain important procedures have been addressed using a very simple and understandable method. The book is strongly recommended for all undergraduates, postgraduate trainees and trainers alike.

**N Chintamani**

MS FRCS (Ed) FRCS (Glas) FRCS (Irel)
FACS FICS (Surg Oncol) FIMSA

Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi, India
Honorary Secretary, Association of Surgeons of India-2012
Governor of Council Member, Association of Surgeons of India
President (Elect), Association of Breast Surgeons of India
Editorial Secretary, Indian Association of Surgical Oncology
Controller of Examinations, College of Surgeons of India
Past President, Indian Society of Wound Management
Chief Editor, Surgical Clinics of India
Joint Editor, Indian Journal of Surgical Oncology
Associate Editor, Indian Journal of Surgery
It is my pleasure to write a Foreword for Dr Makhan Lal Saha’s book, *Bedside Clinics in Surgery*. I know him for more than a decade and though he being a general surgeon worked under me in my neurosurgery department for two years with keen interest and proved his worth.

I have gone through the proofs of his venture and I am sure his efforts will prove results both to the undergraduate and postgraduate students in surgery.

I am confident that his dedication to author this book for last five years and practical experience will be very much useful to them for whom he has written. I am sure his book will be highly appreciated, amply rewarded and accepted by the entire medical students community.

HB 267 Salt Lake, Sector-3  
26th January, 2004

Manoj Kumar Bhattacharya  
MS MCh (Neurosurgery)  
*Formerly*, Dean  
Faculty of Medicine  
University of Calcutta  
Kolkata, West Bengal, India
Keeping in mind the acceptance of the second edition of the book by both undergraduate and postgraduate students of surgery, the basic format of the book is being retained. Almost all the sections have been revised. The concept of exact measurement of a swelling by using a Vernier caliper instead of a tape measurement has been incorporated. A new long case on management of diabetic foot has been added in the long case section. The TNM classification of all the malignant tumors has been updated as per 7th Edition of American Joint Committee on Cancer (AJCC). In X-ray section, interpretation of mammography has been added. In surgical anatomy section, discussions on lower leg compartments and cervical fascia have been added.

Makhan Lal Saha
E-mail: drmlsaha@yahoo.com
Practical examination in surgery is exhaustive, encompassing long cases, short cases, surgical problems, surgical pathology, radiology, surgical instruments, minor surgical procedures, preoperative preparation and operative surgery. At present, there is no book available, which covers all these aspects in a comprehensive manner, suitable for preparation in final MBBS examination. The impetus for writing a book was primarily initiated by one of my favorite students, Dr Shamik Nandy of Calcutta Medical College. This book, very different in its approach, content and design, provides students of MBBS the basic and accurate knowledge of the practical problems, which can be assimilated in a reasonable but short time. With six years of extensive hard work, I have been able to present this book to the students of surgery.

This book covers discussions on almost all aspects of practical examinations. In long and short cases, a sample summary is given and management is discussed based on that particular case. The detailed discussion about that particular disease is presented afterward. The summary described may not be reproducible in examination, but provides a valuable guideline as to how to write a good summary of a particular case. Demonstration of physical signs with photographs and schematic diagrams are also included in each section of the long and short cases. In long and short case discussions, the students have to plan relevant management of the particular clinical situation presented by him in the said examination. The section on surgical problems covers both emergency and non-emergency conditions. A general outline for answer in such a situation is presented. In X-rays section, representative plates are presented and discussion is based on the findings of the particular X-rays. Discussions on the relevant clinical situation are also covered. In surgical pathology section, a representative specimen is described and this section mainly deals with the pathological aspects of the particular disease. For better clarity and understanding, the surgical pathology specimens are printed in color. Preoperative preparations for elective major surgery as well as those associated with common coexisting medical diseases are discussed. The section on minor surgical procedures is not exhaustive and only covers the important procedures commonly asked in examinations. Operative surgery is not discussed in a separate section but important operations are discussed with long and short cases and in other sections of the book. In instrument section, relevant points for identification of the instrument are mentioned. While discussing the use of instruments, emphasis has been given to mention the particular operations where the instrument is used. Sterilization of instruments are discussed in detail. Every attempt has been made to create a condensation of information by pointwise framing that will fulfill the students’ need during examination. Throughout the text, emphasis has been given for methods of demonstration of clinical signs. An attempt has been made to maximize the number of illustrations to complement the general text materials. Photographs and schematic diagrams have been used for demonstration of clinical signs and operative procedures. The book contains 485 illustrations, numerous photographs and X-ray plates.
This book, however, is not a textbook of surgery. I would recommend all the students to go through standard textbooks of surgery for acquiring basic concepts. This book provides a very simple, comprehensive, updated, and well-illustrated account, which may be used as a revision book for preparation for practical examination in surgery. At places, the discussions are exhaustive and may not be required for undergraduate students. These are indicated by italic fonts. I would like to thank Dr Shamik Nandy, who has gone through the whole manuscript and suggested important modifications to make the book suitable for undergraduate students. I would like to thank Prof Biswanath Mukhopadhyay, Professor of Pediatric Surgery, Dr Anadinath Acharya, Assistant Professor of Surgery, Dr Sasanka Sekhar Chatterji, Associate Professor of Plastic Surgery and Dr Sukumar Maiti, Associate Professor of Surgery who have provided majority of the clinical photographs included in the long and short case sections of the book. I would like to thank all the faculty members of the Department of Surgery IPGME & R/SSKM Hospital, Kolkata, West Bengal, India, namely Prof PK Gupta, Dr Sushma Banerji, Dr QM Rahaman, Dr PK Sarkar, Dr Abhimanyu Basu, Dr PS Paul, Dr DK Sarkar, Dr S Das Chowdhury, and Dr SK Halder for their constant help and encouragement while I was preparing this book. They have also gone through the proof of the book. One of my postgraduate students, Dr Srinjoy Saha spent lots of his time in taking different photographs included in this book. Dr Krishnendu Maity, postgraduate student at Calcutta Medical College has also taken some photographs included in this book. Dr Ranjit Das, Dr Kaushik Ghosh, Dr Budhadeb Saha for help in preparation of some sections of this book. I thank my friend and well wisher Prof Sekhar Mukhopadhyaya for his constant encouragement while I was writing this book. He has also helped in designing the cover page of this book. I would like to thank Dr Bansari Goswami, Professor and Head, Department of Surgery, NRS Medical College, and Dr Mrityunjay Mukherji, Professor and Head, Department of Surgery, Calcutta National Medical College for allowing me to take the photographs of surgical pathology specimens included in this book. Dr Sudip Chakraborty, Professor and Head, Department of Urology, and Dr AG Ghosal, Professor and Head, Department of Chest Medicine, IPGME & R, provided some X-ray plates for inclusion in this book. Dr Satinath Mukherji, Associate Professor, Department of Endocrinology for help in writing the section on diabetes and surgery.

I would like to thank Mr Bimal Dhur and Sri Dipankar Dhur of Academic Publishers who were always after me over these years and for their sincere efforts to publish this book in time. Other members of staff of Academic Publishers Sri Abhijit Chakraborty, Sri Biswajit Seal and Sri Swapan Dutta also worked hard for making this publication successful. I thank Mr Narayan Sur and Mr Dilip Das who have drawn the different diagrams included in this book.

I am indebted to my wife Smt Priti Saha and my daughters Priyanka and Monica for their wholehearted support in this endeavor. I will never forget their sacrifice of long hours of family associations over these years while I was busy in preparing this book.

My sincere thanks are due to my enthusiastic young students, friends, relatives and well-wishers for their constant support, encouragement and help.

In spite of all precautions, a good number of printing errors might have gone unnoticed. I would request all the students to go through the corrigendum and correct the text to avoid confusion.

I hope this book will be beneficial to students of surgery and my efforts will be amply rewarded only if this book is accepted by the students and teachers of surgery. I apologise for any inadvertent mistakes, which might have been overlooked. I will be happy to receive comments, criticisms and suggestions for the improvement of this book in future from my readers, which I shall duly incorporate in the next edition of the book. The comments and the suggestions may please be sent to me at my residential address or to my E-mail address.

Makhan Lal Saha

E-mail: drmlsaha@yahoo.com
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## Section 1  Surgical Long Cases

### 1. Introduction

Outline for Writing a Surgical Long Case 1
- Physical Examination 5
- Clinical Questions on General Survey 9

Outline for Writing a Case of Swelling 25
- Clinical Questions 27

Outline for Writing a Case of Ulcer 35
- Outline for Writing a Case of Sinus or Fistula 36

### 2. Hernias

Outline for Writing a Case of Hernia 38
- History 38
- Physical Examination 39
- Summary of the Case 41
- Provisional Diagnosis 41
- Investigations Suggested 42
- Differential Diagnosis 42
- Indirect Reducible Inguinal Hernia in an Adult 42
- Inguinal Hernia with Features of Prostatism 68
- Recurrent Inguinal Hernia 70

Incisional Hernia: Outline for Writing a Long Case of Incisional Hernia 71
- History 71
- Physical Examination 72
- Summary of the Case 72
- Provisional Diagnosis 72
- Investigations Suggested 72

### 3. Abdomen

Outline for Writing an Abdominal Case 85
- History 85
- Physical Examination 87
- Summary of the Case 90
- Provisional Diagnosis 90
- Investigations Suggested 90
- Differential Diagnosis 90

#### Cases Presenting with Gastric Outlet Obstruction 103
- Gastric Outlet Obstruction due to Carcinoma of Stomach 103
- Discussion on Gastric Lymphoma 117
- Discussion on Gastrointestinal Stromal Tumor 120
- Gastric Outlet Obstruction due to Complication of Chronic Duodenal Ulcer 124

#### Peptic-Ulcer Disease 126
- Chronic Gastric Ulcer and Chronic Duodenal Ulcer 126

#### Case of Chronic Cholecystitis 138

#### Cases Presenting with Obstructive Jaundice 147
- Obstructive Jaundice due to Periampullary Carcinoma or Carcinoma of Head of Pancreas 147
- Obstructive Jaundice due to Choledocholithiasis 166
- Carcinoma of Gallbladder (Presenting with or without Obstructive Jaundice) 171
- Discussion on Cholangiocarcinoma 177
- Obstructive Jaundice due to Choledochal Cyst 181

#### Cases Presenting with Abdominal Lump 185
- Abdominal Lump due to Hydatid Cyst of Liver 185
- Pseudocyst of Pancreas 193
- Carcinoma of Colon 199

### 4. Urinary Cases

Outline for Writing Urinary Cases 210
- History 210
- Physical Examination 211
- Summary of the Case 214
- Provisional Diagnosis 214
- Differential Diagnosis 214
Clinical Questions 214
- Hydronephrosis 216
- Carcinoma of Kidney 220

5. Breast 226

Writing a Long Case of Carcinoma of Breast 226
- History 226
- Physical Examination 227
- Summary of the Case 229
- Provisional Diagnosis 229
- Differential Diagnosis 229
- Investigations Suggested 229

Early Carcinoma of Breast in a Premenopausal Woman 238
Locally Advanced Carcinoma of Breast 251
Management of Carcinoma of Breast with Distant Metastasis 255

6. Thyroid 272

Writing a Long Case of Thyroid Disease 272
- History 272
- Physical Examination 274
- Summary of the Case 276
- Provisional Diagnosis 276
- Investigations Suggested 277
- Differential Diagnosis 277

Nontoxic Multinodular Goiter or Colloid Goiter 284
Solitary Thyroid Nodule 291

Primary Thyrotoxicosis (Graves’ Disease) 295

7. Varicose Veins 321

Outline for Writing a Long Case of Varicose Veins 321
- History 321
- Physical Examination 322
- Varicose Veins 323

8. Peripheral Vascular Disease 345

Outline for Writing a Long Case of Buerger’s Disease and Atherosclerotic Peripheral Vascular Disease 345
- History 345
- Physical Examination 346
- Summary of the Case 349
- Provisional Diagnosis 349
- Differential Diagnosis 349
- Investigations Suggested 349
- Buerger’s Disease 349
- Atherosclerotic Peripheral Vascular Disease 365
- Diabetic Foot 365
- Local Examination—Examination of Both Lower Limbs 366

9. Skin and Subcutaneous Tissue 381

Skin and Subcutaneous Tissue 382
- Dermoid Cyst 382
- Implantation Dermoid 387
- Submental Dermoid 388
- Sebaceous Cyst 389
- Lipoma 392
- Keloid 395
- Postburn Contracture 397

- Questions about Burns 399
- Malignant Melanoma 400
- Malignant Melanoma with Lymph Node Metastasis 404
- Benign Pigmented Nevus 413
- Squamous Cell Carcinoma 416
- Basal Cell Carcinoma 422
- Marjolin’s Ulcer 426
- Soft Tissue Sarcoma 428
10. Blood Vessels and Nerves 439
   - Hemangioma 439
   - Plexiform Hemangioma (Cirrroid Aneurysm) 442
   - Glomus Tumor 444
   - Raynaud's Disease/ Raynaud's Syndrome 445
   - Arteriovenous Fistula 449
   - Neurofibroma 452
   - Plexiform Neurofibromatosis (Pachydermatocel) 454
   - Generalized Neurofibromatosis (von Recklinghausen's Disease) 456
   - Meningocele/Meningomyelocele 458

Nerve Injuries 462
   - Radial Nerve Injury 463
   - Ulnar Nerve Injury 473
   - Median Nerve Injury 477

11. Neck Swellings 484
   - Cystic Hygroma 484
   - Ranula 487
   - Thyroglossal Cyst 490
   - Thyroglossal Fistula 493
   - Branchial Cyst 494
   - Branchial Sinus (Fistula) 499
   - Tubercular Cervical Lymphadenitis 501

Metastatic Cervical Lymph Node Swelling with Unknown Primary 507
   - Malignant Lymphoma 513
   - Cervical Rib 518
   - Carotid Body Tumor 522
   - Pharyngeal Pouch 525

12. Salivary Gland 530
   - Mixed Parotid Tumor 531
   - Adenolymphoma 539
   - Carcinoma Parotid Gland 540
   - Chronic Sialadenitis of Left Submandibular Salivary Gland due to Calculus in Submandibular Duct 546
   - Carcinoma of Submandibular Salivary Gland 549
   - Parotid Fistula 551

13. Mouth and Oral Cavity 553
   - Clinical Examination 553
   - Cleft Lip 554

14. Breast, Hernias and Abdominal Wall 594
   - Carcinoma in Male Breast 594
   - Bilateral Gynecomastia 596
   - Fibroadenoma Breast 598
   - Cystosarcoma Phylloides or Phylloides Tumor in Breast 599
   - Congenital Hernia 600
   - Umbilical Hernia 602
   - Paraumbilical Hernia in Adults 605
   - Epigastric Hernia 608
   - Femoral Hernia 609
   - Lumbar Hernia 613
   - Persistent Vitellointestinal Duct 614
   - Umbilical Adenoma or Raspberry Tumor 616
   - Urachal Fistula 617
   - Desmoid Tumor in the Lower Abdominal Wall 618

15. Genitalia and Urethra 620
   - Vaginal Hydrocele 620
   - Encysted Hydrocele of the Cord 626
   - Cyst of Epididymis 627
   - Varicocele 628
   - Undescended Testis 634
   - Filarial Scrotum and Ramhorn Penis 643
   - Phimosis 646
   - Peyronie's Diseases 650
   - Carcinoma Penis 651
   - Hypospadias 660
   - Ectopia Vesicae 666
   - Testicular Tumor 669
16. **Surgical Problems** 677
- Road Traffic Accident 677
- Head Injury 685
- Chest Injury 689
- Abdominal Injury 695
- Splenic Injury 699
- Liver Injury 703
- Pancreatic Injury 708
- Renal Injury 713
- Ruptured Urethra 717
- Burn Injury 719
- Acute Pain in Right Upper Quadrant of Abdomen 726
- Acute Pain in Right Lower Quadrant of Abdomen 729
- Lump in Right Iliac Fossa 731

17. **X-rays** 775
- Straight X-ray of Chest/Abdomen with Free Gas Under Both Domes of Diaphragm 776
- Plain X-ray of Abdomen, Multiple Air Fluid Levels 781
- Sigmoid Volvulus 788
- Radiopaque Gallstone and Kidney Stone 794
- Radiopaque Kidney Stones and Bladder Stone 796
- Cannonball Metastasis 799
- Subphrenic Abscess 803
- Endoscopic Retrograde Cholangiopancreatography 806
- Worm in Common Bile Duct 808
- Endoscopic Retrograde Cholangiopancreatography—Chronic Pancreatitis 810
- T-tube Cholangiogram 813
- Barium Swallow X-ray of Esophagus—Achalasia Cardia 816

- Acute Pancreatitis 735
- Peptic Perforation 742
- Intestinal Obstruction 744
- Brust Abdomen 747
- Postoperative Pyrexia 749
- Acute Retention of Urine 751
- Hematuria 754
- Solitary Thyroid Nodule 756
- Respiratory Distress Following Thyroidectomy 758
- Gangrene of Foot 759
- Abnormal Nipple Discharge 462
- Breast Lump 763
- Deep Vein Thrombosis 765
- Wound Infection 768

- Barium Swallow—Carcinoma of Esophagus 818
- Barium Meal X-ray—Chronic Duodenal Ulcer 822
- Barium Meal X-ray—Benign Gastric Ulcer 822
- Barium Meal X-ray—Carcinoma Stomach 824
- Barium Meal X-ray—Gastric Outlet Obstruction and Duodenal Obstruction 826
- Barium Meal Follow-through—Ileocecal Tuberculosis/Jejunal Stricture 829
- Barium Meal Follow-through—Recurrent Appendicitis 833
- Barium Enema—Carcinoma Colon 836
- Intravenous Urogram—Hydronephrosis 842
- Intravenous Urogram—Carcinoma Kidney 844
- X-ray Skull—Skull Bone Fracture 845
- Chest X-ray—Chest Injury 847
- Mammography 851
### Section 5  Surgical Pathology

**18. Surgical Pathology** 855

- Benign Gastric Ulcer 855
- Perforated Benign Gastric Ulcer 859
- Carcinoma of Stomach 860
- Acute Appendicitis 865
- Small Cut Stricture 869
- Intussusception 871
- Meckel’s Diverticulum 874
- Polyposis of Colon 876
- Carcinoma of Colon 879
- Carcinoma of Rectum 883
- Ulcerative Colitis 886
- Hydatid Cyst 889
- Gallstone Disease 894
- Cholesterosis of Gallbladder 901
- Carcinoma of Gallbladder 902
- Polycystic Kidney 904
- Hydronephrosis 906
- Carcinoma of Kidney (Hypernephroma) 909
- Tuberculosis of Kidney 912
- Papillary Carcinoma of Urinary Bladder 914
- Benign Enlargement of Prostate 919
- Testicular Tumors 922
- Carcinoma of Penis 926
- Carcinoma of Breast 928

### Section 6  Preoperative Preparations

**19. Preoperative Preparations** 933

- Preoperative Preparation for an Elective Major Surgery 933
- Preoperative Preparation in a Case of Toxic Goiter 937
- Preoperative Bowel Preparation for Colorectal Surgery 937
- Preoperative Preparation in a Case of Gastric Outlet Obstruction 938
- Preoperative Preparation in a Case with Obstructive Jaundice 939
- Preoperative Preparation of a Patient with Diabetes Mellitus 940
- Preparation of Patient with Associated Heart Disease for Surgery 944
- Preparation of Patient with Chronic Respiratory Disease for Elective Major Surgery 946
- Preoperative Preparation of Patient with Chronic Renal Disease 947

### Section 7  Minor Surgical Procedures

**20. Minor Surgical Procedures** 949

- Insertion of a Nasogastric Tube 949
- Starting an Intravenous Line 950
- Arterial Blood Gas 951
- Establishing a Central Venous Line by Subclavian Vein Puncture 952
- Internal Jugular Vein Cannulation 953
- Catheterization for Retention of Urine 954
- Abscesses 955
- Drainage of Peritonsillar Abscess 956
- Ludwig’s Angina 956
- Parotid Abscess 957
- Axillary Abscess 957
- Perinephric Abscess 958
- Anorectal Abscesses 959
- Breast Abscess 960
- Hand Infections 961
- Drainage of Pulp Space Infection of Finger 962
Bedside Clinics in Surgery

- Volar Space Infection 963
- Web Space Infection 963
- Infection of Middle Palmar Space 964
- Thenar Space Infection 964
- Infection of Ulnar Bursa of the Hand 965
- Drainage of Infection in Space of Parona 966
- Infection of Flexor Tendon Sheaths 966

Aspiration of Pleural Fluid (Thoracocentesis) 966
Insertion of a Chest Drain 967
Pericardiocentesis 968
- Peritoneal Fluid Tap 969
Cricothyrotomy 970
Sclerotherapy for Piles 971
Sclerotherapy for Ganglion 972
Lymph Node Biopsy 972
Excision of Sebaceous Cyst 972
Excision of Lipoma 973
Management of Ingrowing Toe Nail 973
Dorsal Slit of Prepuce 974
Sclerotherapy for Varicose Veins 974
Exposure and Ligature of External Carotid Artery 975
Exposure of Subclavian Artery in the Neck 976
Exposure of the Third Part of the Subclavian Artery 976
Exposure and Ligature of the Internal Iliac Artery 977
Exposure of the External Iliac Artery 979
Exposure of the Femoral Artery in the Thigh (in Adductor Canal) 980
Exposure of the Popliteal Artery 981
Peripheral Nerve Blocks 982
- Digital Nerve Block 982
- Median Nerve Block 982
- Ulnar Nerve Block 982
- Posterior Tibial Nerve Block 983

Section 8 Instruments

21. Instruments 985
- Sterilization of Instruments 986
- Rampley’s Swab Holding Forceps 987
- Towel Clips 989
- Bard-Parker’s Handles 990
- Surgical Blades 990
- Hemostatic Forceps 993
- Kocher’s Hemostatic Forceps 997
- Mosquito Hemostatic Forceps 998
- Mayo’s Pedicle Clamp 999
- Lister’s Sinus Forceps 999
- Allis Tissue Forceps 1000
- Babcock’s Tissue Forceps 1001
- Lanes’ Tissue Forceps 1001
- Plain Dissecting Forceps 1002
- Toothed Dissecting Forceps 1003
- Needle Holders 1004
- Needles 1005
- Skin Closure Clips and Accessories 1009
- Skin Staplers 1010
- Mayo’s Scissors 1010
- McIndoe Scissors 1011
- Metzenbaum Scissors 1012
- Heath’s Suture Cutting Scissors 1012
- Langenbach’s Retractor 1013
- Czerny’s Retractor 1013
- Morris’ Retractor 1013
- Hook Retractors 1014
- Cat’s Paw or Volkman’s Retractor 1015
- Fisch Nerve Hook 1015
- Deaver’s Retractor 1015
- Self-retaining Abdominal Retractor (Balfour’s Type) with Provision for Attachment for Third Blade 1016
- Millin’s Self-retaining Bladder Retractor with a Provision for Attachment of Third Blade 1017
- Joll’s Thyroid Retractor 1018
- Kocher’s Thyroid Dissector 1018
- Cord Holding Forceps 1019
- Malleable Olive Pointed Probe 1020
- Olive Pointed Fistula Director with Frenum Slit 1023
- Piles Holding Forceps 1023
- Right Angled Forceps (Lahey’s Forceps) 1026
Section 9 Operative Surgery

22. Operative Surgery 1083

- Steps of Lichtenstein Hernioplasty 1083
- Steps of Herniotomy for Congenital Hernia 1084
- Steps of Transabdominal Preperitoneal Operation 1085
- Steps of Total Extraperitoneal Operation for Inguinal Hernia 1088
- Anatomy of Abdominal Incisions 1089
- Steps of D2 Gastrectomy for Gastric Cancer 1092
- Steps of Total Gastrectomy 1094
- Steps of Truncal Vagotomy and Gastrojejunostomy 1097
- Steps of Repair of Peptic Perforation 1099
- Steps of Laparoscopic Cholecystectomy 1100
- Open Cholecystectomy 1103
- Steps of Choledocholitotomy 1104
- Steps of Choledochoduodenostomy 1107
- Steps of Whipple’s Pancreatodudodenectomy 1107
- Steps of Lateral Pancreaticejejunostomy 1110
- Steps of Right Hemicolectomy 1112
- Steps of Low Anterior Resection 1114
- Steps of Abdominoperineal Resection 1116
- Steps of Transverse Colostomy 1119
- Steps of Closure of Colostomy 1120
- Step of Appendicectomy 1121
- Splenectomy 1123
- Nephrectomy 1125
- Steps of Modified Radical Mastectomy 1126
- Steps of Lumbar Sympathectomy 1128
- Steps of Total Thyroidectomy 1129
- Steps of Left Hemithyroidectomy 1131
- Steps of Superficial Parotidectomy 1133
Section 10 Surgical Anatomy

23. Surgical Anatomy 1145

- Inguinal Canal 1145
- Anatomical Concept in View of Laparoscopic Repair of Hernia 1151
- Anterior Abdominal Wall 1152
- Esophagus 1156
- Stomach 1158
- Anatomy of Liver and Extrahepatic Biliary System 1166
- Appendix 1176
- Autonomic Nervous System 1184
- Breast 1187
- Cervical Fascia 1197
- Thyroid Gland 1199
- Subclavian Artery 1203
- Anatomy of Common Carotid Artery in the Neck 1204
- Cervical Lymph Nodes 1208
- Salivary Glands 1209
- Anatomy of Testis, Blood Supply and Lymphatic Drainage 1209
- Fascial Compartments of the Thigh 1214
- Fascial Compartments in the Leg 1218

Index 1221
Clinical Classes in Surgery: Total 26 weeks
3rd Semester : 6 weeks
4th Semester : Nil
5th Semester : 4 weeks
6th Semester : Nil
7th Semester : 4 weeks
8th Semester : 6 weeks
9th Semester : 6 weeks

Final MBBS Surgery Examination: Marks Distribution for Surgery

- **Theory:** 2 Papers: 120 (60+ 60) 2½ hours duration in each paper
  - **Paper I:**
    - Section 1: General surgery
    - Section 2: Orthopedic surgery
  - **Paper II:**
    - General surgery
    - Anesthesiology
    - Dentistry
    - Radiotherapy
    - Radiology

- **Oral:** 20 marks
- **Practical:** 100 marks
- **Internal assessment:** 60 (Theory 30 + Practical 30)
- **Total marks:** 300 marks
- **Pass criteria:** 50% in aggregate.
  - Practical minimum 50%
  - Theory and oral minimum 50%.

**Honours:** 75% marks in the subject provided other subjects are cleared in one chance.

Surgery Theory Examination

- **Paper I:** 60 marks
  - Section I:
    1. Long question type (compulsory) 10 + 5 = 15
       » General principle/Basic science.
    2. Long question (1 out of 2) – 15
       » Gastrointestinal tract.
3. Short answer type (5 out of 6) 2 × 5 = 10
   » General surgery.

Section II:
4. Short notes (5 out of 7) 4 × 5 = 20
   » Orthopedics.

Paper II:
1. Long question (Compulsory) – 15
   » Endocrine and breast:
     Thyroid
     Parathyroid
     Adrenal
     Breast.
2. Long question (1 × 15 = 15) or Short notes (3 out of 5) 3 × 5 = 15
   » Genitourinary.
3. Short answer type (2 out of 3) 2 × 5 = 10
   » Pediatric
   » Plastic
   » Neurosurgery
   » Cardiothoracic and vascular surgery.
4. Short notes (4 out of 5) 4 × 5 = 20
   » Anesthesiology
   » Radiology
   » Dental
   » Radiotherapy, etc.

Surgery Practical Examination

One long case (30 minutes) 40 marks
- History: 15 marks
- Clinical examination: 10 marks
- Discussion: 15 marks

Two short cases (5 × 2 = 10 minutes) – 20 × 2 = 40 marks
- Discussion on clinical findings
- Clinical demonstration
- Management

Operative: 20 marks
- Operative steps: 10
- Surgical anatomy/Preoperative/Postoperative: 10

Oral: 20 marks
- X-ray/other imaging: 5 marks
- Instrument: 5
- Specimen: 5
- Problems and recent advances: 5
**Carcinoma in Male Breast**

**Clinical Examination**

*(See Page No. 381, Chapter 9)*

**History**
- History of swelling—onset and progress
- Any pain in the breast
- Any skin changes noticed by the patient
- Any history of retraction of nipple and areola
- Any swelling in the axilla, neck, or opposite breast
- Any history of loss of appetite, loss of weight, and any history of jaundice
- Any chest pain, cough, and hemoptysis. Any history of breathlessness
- Any history of recent onset of backache, aches, and pains in the limbs or any bony swelling
- Any history of headache, mental changes, loss of consciousness, convulsion, and weakness of any of the limbs.

**Examination**
- **Inspection:**
  - Position and symmetry of both breasts
  - Nipple and areola (any discharge, retraction, cracks, fissure, or ulcer)
  - Any swelling in the breast—site and extent/size and shape/surface and margin
  - Skin over the breast and the swelling (color change, peau d'orange, ulcer, or satellite nodules)
  - Lift arm above the head and assess any change—any skin dimpling or alteration of position of nipple.
- **Palpation:**
  - Palpate the breast with the palmar surface of the fingers
  - Palpate the normal breast first
  - Palpation of the swelling—temperature/tenderness/site and extent/size and shape/surface and margin/consistency
Any skin tethering (ascertained by moving the lump and note whether any skin dimple appears on the skin).

Any skin fixity—try to lift the skin from the underlying lump—skin may be free or fixed to the underlying lump

Test for fixity to chest wall

Test for fixity of the lump to the underlying pectoralis major muscle or to serratus anterior muscle

Palpation of axillary lymph nodes and supraclavicular lymph nodes.

Q. What is your case? (Summary of a case of carcinoma in male breast)

Ans. This 55-year-old gentleman presented with a swelling in his right breast for last 1 year. The swelling was about 2 cm in size at the onset and was increasing in size slowly, since the onset for about 9 months. But for last 3 months, the swelling is rapidly increasing in size and there is ulceration over the swelling for last 2 months. The ulcer was about 1 cm at the onset and increasing in size since then. There is discharge of serous fluid from the ulcer site. Patient also complains gradual destruction of the right nipple. He complains of dull aching pain over the swelling for last 2 months. He also complains of a swelling in his right axilla from last 3 months, which was about 1 cm at the onset and is gradually increasing size. Patient has no other systemic complaints (Fig. 14.1).

On examination: The right breast is enlarged and asymmetric in comparison to left breast. The nipple is pushed outward and upward, there is destruction of areolar area. there is a swelling in the right breast 6 cm × 5 cm, occupying all the quadrants of the breast, spherical in shape, surface is irregular, and margins are well defined. the swelling is firm in consistency, mobile, fixed to the overlying skin, and underlying pectoral muscle, but not to chest wall. There is an ulcer overlying the tumor involving the areolar area—3 cm in diameter circular in shape, margins are raised and floor is covered with necrotic tissue. A single lymph node is palpable in the right axilla, which is firm in consistency and is mobile.

Q. What is your diagnosis?

Ans. This is a case of carcinoma of right breast in a male patient aged 55 years T4bN1M0.

Q. What are the risk factors for development of male breast cancer?

Ans.

◆ Gynecomastia
◆ Klinefelter’s syndrome—associated with testicular atrophy
◆ Mutation in BRCA2 gene is associated with increased risk of breast cancer in males.
**Q. Why disease is more advanced in male patient at presentation?**

**Ans.** The breast is small in size. As the tumor grows, there is early invasion of the growth into the skin and the underlying pectoral muscles or chest wall.

**Q. How will you manage this patient?**

**Ans.** I would like to confirm my diagnosis by doing an ultrasonography (USG) of both breast and a trucut biopsy from the breast lump.

Other investigations will include:
- Chest X-ray posteroanterior (PA) VIEW
- Electrocardiogram (ECG)
- Complete hemogram
- Liver function test (LFT)
- USG of abdomen
- As the disease is local advanced, a whole body bone scanning is required.

**Q. How will you treat this patient?**

**Ans.** Modified radical mastectomy followed by adjuvant therapy.

**Q. What adjuvant therapy you will plan for this patient?**

**Ans.** In view of large tumor and lymph node metastasis for locoregional treatment, I will give postoperative radiotherapy to the breast flap and lymph node fields in the supraclavicular and internal thoracic chain. If adequate axillary dissection is done, axillary irradiation is not required except when there is extracapsular spread of the tumor.

If axillary lymph node shows metastasis postoperative chemotherapy with either CMF (cyclophosphamide, methotrexate, 5-fluorouracil) or CAF (cyclophosphamide, adriamycin, 5-fluorouracil) is to be considered.

**Q. What is the role of hormone therapy in male breast cancer?**

**Ans.** About 70–80% male breast cancer is estrogen receptor positive and about 65% is progesterone receptor positive. Hormone therapy is effective in such cases.

- First-line hormone therapy: Orchidectomy or tamoxifen therapy.
- Second-line therapy: Analogues (goserelin) or aromatase inhibitors (anastrozole or letrozole).

**BILATERAL GYNECOMASTIA**

**Clinical Examination**

*See Page No. 382, Chapter 9.*

**History**

- Age (in patient between 10 years and 20 years majority are idiopathic. In elderly patient, usually secondary to some cause)
- Onset and progress of enlargement of the breast—unilateral or bilateral
- Any history of pain (usually painless)
Any history of liver disease (hepatitis), renal disease, and mumps orchitis
Any history of drug intake like estrogens (given for prostatic carcinoma), diuretics, digitalis, steroids, and tranquilizers. These drugs may cause gynecomastia.

**Examination—Inspection/Palpation**

- Unilateral or bilateral enlargement
- Degree of enlargement—mild, moderate, or severe (in severe type may resemble female breast).
- Feel the breast disk.
- Hard (commonly found in young boys) or soft enlargement (usually found in elderly patients commonly due to drug therapy).
- The skin over the breast, nipple, and areola. These are usually normal.
- Examine the axillary lymph nodes (axillary lymph nodes are not enlarged).
- Examine abdomen for hepatic enlargement.
- Examine chest to exclude any lung lesion.
- Examine both testes (testicular atrophy or estrogen secreting testicular tumor may be associated with gynecomastia).

**Q. What is your case? (Summary of a case of bilateral gynecomastia)**

**Ans.** This 12-year-old boy presented with gradually increasing swelling of his both breasts for last 2 years. No history of rapid increase in size of the swelling, no discharge from the nipple. Patient has no other complaints (Fig. 14.2).

*on examination:* There is symmetrical enlargement of both breasts. Nipple and areola appears normal. On palpation, the firm breast disk palpable on both sides, which is mobile, free from skin, and the underlying pectoral muscle. Abdominal and chest examination is normal. Both the testes are normally palpable.

**Q. What is your diagnosis?**

**Ans.** This is a case of bilateral gynecomastia.

**Q. What is idiopathic gynecomastia?**

**Ans.** Gynecomastia may be secondary to some causes, when no cause could be discerned from history, clinical examination, and investigation then it can be regarded as idiopathic gynecomastia.
Q. What is gynecomastia?
Ans. Enlargement of the male breast is called gynecomastia.

Q. What is physiological gynecomastia?
Ans. Teenage boys achieving puberty and the elderly men (senescence) may have physiological enlargement of breast.

Q. What are the important causes of gynecomastia?
Ans.
- Secondary to some drug therapy:
  - Digoxin
  - Spironolactone
  - Anabolic steroid or estrogens.
- Secondary to some underlying disease:
  - Testicular tumors
  - Testicular atrophy (due to mumps orchitis or leprosy)
  - Chronic liver disease
  - Klinefelter’s syndrome
  - Bronchial carcinoma
  - Adrenocortical carcinoma
  - Chronic renal failure
  - Thyrotoxicosis.

Q. How will you treat this patient?
Ans.
- Reassurance
- Surgery—for cosmetic reason.
  - Subcutaneous mastectomy with preservation of nipple and areola.

### FIBROADENOMA BREAST

Q. What is your case? (Summary of a case of fibroadenoma of breast)
Ans. This 20-year-old girl presented with a swelling in her right breast for last 3 years. The swelling was 1 cm in size at the onset and the swelling is increasing very slowly in size over last 3 years. There is no history of rapid increase in size of the swelling. No discharge from the nipple. No other complaint is there.

On examination: There is a swelling in the upper–outer quadrant of right breast, globular in shape 2 cm × 2 cm smooth surface, well-defined rounded margins, firm in consistency, free from the skin, and is very much mobile in relation to the breast tissue, the swelling is slipping under finger when pressed. No other swelling in the breast. No palpable lymph nodes in the axilla.

Q. What is your diagnosis?
Ans. This is a case of fibroadenoma in right breast located at the upper–outer quadrant.
Q. What is fibroadenoma?
Ans. This is a benign breast disease containing both fibrous and glandular tissue. This is not a true tumor and has been regarded as one spectrum of aberrations of normal development and involution (ANDI).

Q. What is the natural history of fibroadenomas?
Ans. The fibroadenomas are very slow-growing lesions. It has been observed that majority of the fibroadenomas regress spontaneously over years.

Q. How will you manage this patient?
Ans.
- I would advise an ultrasonography of breast to assess the lump.
- A fine-needle aspiration cytology (FNAC) may confirm the diagnosis of fibroadenoma.
- As the lesion is small, I will wait and watch and do regular follow up, as majority of fibroadenomas may regress spontaneously.

Q. When will you consider surgical treatment?
Ans. Excision of the fibroadenoma is indicated:
- Fibroadenoma larger than 4 cm in size.
- When the tumor is increasing in size at follow up.
- Patient is apprehensive and wants to get the tumor removed.
- In patient with age more than 30 years.
- When there is suspicion of malignancy.

Q. What operation will you do?
Ans. Emulative of fibroadenoma—approach is usually through a circumareolar or submammary incision. The incision is deepened and an incision is made over the capsule and the tumor is enucleated leaving behind the capsule.

Q. What are the pathological types of fibroadenoma?
Ans. Depending on the relative preponderance of the fibrous and the glandular tissue two types of fibroadenomas are described:
- *Pericanalicular type (hard fibroadenoma)*—the proliferation of fibrous tissue is more than the glandular element. The tumor may feel firm and is freely mobile within the breast tissue.
- *Intracanalicular type (soft fibroadenoma)*—proliferation of glandular tissue is more preponderant than the fibrous tissue and the lump may appear soft in feel.

Q. What do you mean by giant fibroadenoma?
Ans. Fibroadenomas more than 5 cm in diameter are called giant fibroadenomas.

CYSTOSARCOMA PHYLLODES OR PHYLLODES TUMOR IN BREAST

Characteristics of Phyllodes Tumor
- These tumors increase in size rapidly and may attain very large size and occupy the whole breast (Fig. 14.3).
The lump is soft in feel, surface may be lobulated, mobile, free from the skin, and the underlying pectoral muscle.

The skin may appear shiny and there may be dilated veins in the skin, in late stages, there may be pressure necrosis of the overlying skin resulting in an ulcer.

Histologically, the phyllodes tumor shows a picture intermediate between a benign histology and a sarcoma like appearance. There are more cellularity, pleomorphism, and mitotic activity.

Following excision there is increased chance of local recurrence.

Q. How will you treat patients with cystosarcoma phyllodes?

Ans.

- A phyllodes tumor should be excised with a margin of normal tissue.
- Patient presenting with recurrent phyllodes tumor is to be treated with simple mastectomy.

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CONGENITAL HERNIA

Clinical Examination

See Page No. 382, Chapter 9.

History

- History of the swelling—onset (usually from birth), progress of the swelling
- Site of the swelling—in the groin or in both groin and scrotum
- Progress of the swelling and what happens to the swelling when the child strains (coughing and crying) or when the child is lying in the bed—a hernial swelling gets aggravated on straining and reduces or disappears on lying down.
- Any pain over the swelling
- Any history of irreducibility of the swelling
- Any history suggestive of acute intestinal obstruction associated with irreducibility of the swelling—pain abdomen, vomiting, absolute constipation, and abdominal distension
- Any history of chronic straining factors like—chronic cough, constipation, or difficulty in passing urine.

Examination—Inspection/Palpation

- Swelling—Site and extent (congenital hernia usually extends up to the bottom of the scrotum)/size and shape/surface and margin/consistency
- Expansile impulse on cough
- Whether it is possible to get above the swelling (swelling is scrotal or inguinoscrotal?)
- Reducibility—An uncomplicated hernia is reducible
Deep ring occlusion test—Congenital hernia occurs through the deep ring. A deep-ring occlusion test is not required in examination of congenital hernia as inguinal canal is not developed in infants.

Assess the content of the hernia sac—omentum or intestine
- Doughy feel, dull note on percussion and absent bowel sounds will suggest omentocele
- Soft elastic feel, reduction with gurgling sound, resonant percussion note, and presence of bowel sound will suggest enterocele.

Q. What is your case? (Summary of a case of congenital hernia)

Ans. Patient’s mother states that this 10-month-old male child has swelling in left inguinoscrotal region since birth, and since then the swelling is gradually increasing in size. The swelling increases when the child sits, crawls, and strains. The swelling disappears when the child lies down (Fig. 14.4).

On examination, there is a left-sided inguinoscrotal swelling showing expansile impulse on cough. The swelling is reducible and there is gurgling sound during reduction.

Q. What is your diagnosis?

Ans. This is case of left-sided congenital hernia in a 10-months-old male child, content is intestine.

Q. How is the inguinal canal in children?

Ans. In newborn, the inguinal canal does not develop and superficial and deep inguinal rings lie close to each other. By 2 years, the deep ring moves laterally and proper inguinal canal can be identified.

Q. What is the basic defect in congenital hernia?

Ans. The basic defect in congenital hernia is the failure of obliteration of processus vaginalis. The inguinal canal structure and mechanism remain intact.

Q. Why early operation is indicated in infants?

Ans. Early operation is indicated in infants particularly those below 6 months of age because of high chance of strangulation.

Q. What operation will you do?

Ans. The surgical treatment will be herniotomy.

Q. What is the difference in technique in older children?

Ans. In child more then 2 years of age, the external and internal ring become widely separated, so that direct dissection is no longer possible.
In these cases, skin incision is made slightly laterally over the internal inguinal ring. The skin and superficial fascia is incised. The external oblique aponeurosis is incised and inguinal canal exposed—the external ring is not opened.

The cremasteric fascia and internal spermatic fascia is incised and sac dissected free from the cord structures. The sac is clamped across and the distal part of the sac transected and kept open. The proximal part of the sac is dissected up to the deep ring and tackled as described above.

**Q. Describe the steps of herniotomy for congenital hernia?**

**Ans.** See operative Surgery, Section, Page No. 1084, 1085, Chapter 22.

**Q. What are the indications of herniorrhaphy in children?**

**Ans.**
- Children with high risk of recurrent hernia should have a formal herniorrhaphy.
- These include:
  - Children who underwent ventriculoperitoneal shunt.
  - Patient on continuous ambulatory peritoneal dialysis.
  - Malnutrition.
  - Growth failure.
  - Patient with connective tissue disorder as in Ehlers-Danlos syndrome and Marfan’s syndrome.

**Q. What is the chance of developing hernia on opposite side?**

**Ans.** About 10% of children on follow up develop contralateral hernia.

**Q. What is the incidence of patent processus vaginalis on the contralateral side?**

**Ans.**
- Patent processus vaginalis may be present on opposite side of hernia in 100% of cases up to 1 week after birth.
- By the age of 2 years, only 25% has patent processus vaginalis.
- However, all patients with patent processus vaginalis do not develop hernia.
- Only 5–10% patient will develop hernia on the contralateral side.
- So, routine exploration of the opposite side is not advisable.

**Q. Do you like to do routine contralateral exploration in congenital hernia?**

**Ans.**
- Earlier, it was done routinely in children with unilateral hernia.
- But different series showed only 5–10% chance of developing hernia on contralateral side.
- So, routine contralateral exploration is not required.

### UMBILICAL HERNIA

**Q. What is your diagnosis?**

**Ans.** This is a case of uncomplicated umbilical hernia in a female child aged 4 years (Fig. 14.5).
Q. What is your case? (Summary of a case of umbilical hernia)

Ans. This 4-year-old female child presented with a swelling in her umbilicus since birth. The swelling is increasing in size since then. The swelling gets aggravated by strenuous activities like walking, running, and crying and the swelling gets spontaneously reduced on lying down. No pain over the swelling and there is no history of irreducibility.

On examination: The umbilicus is stretched and everted due to a swelling in the umbilicus. The swelling shows expansile on cough and the swelling gets reduced spontaneously on lying down. There is a gurgling sound during reduction of the swelling. A gap of about 2 cm is palpable in the umbilical cicatrix.

Q. What is your diagnosis?

Ans. This is a case of uncomplicated umbilical hernia in a female child aged 4 years.

Q. What is umbilical hernia?

Ans. This is a herniation through a weak umbilical cicatrix, which fails to close after birth.

Q. How will you manage this patient?

Ans. There is a wide gap and the child is 4-year-old, so this hernia is unlikely to close spontaneously, so I will consider surgical treatment.

◆ I will do some investigations to assess her fitness for anesthesia.
◆ Blood for Hb% total leukocyte count (TLC), differential leukocyte count (DLC), and erythrocyte sedimentation rate (ESR)
◆ Urine examination
◆ Chest X-ray.

Q. What operation will you do?

Ans. I will do an anatomical repair.

◆ A curved incision is made below the umbilicus with convexity downward and the anterior rectus sheath is exposed.
◆ The skin flap is raised above and the hernial sac is dissected free.
◆ The hernial sac is opened and the contents reduced.
◆ The redundant sac is excised and the hernial sac is closed at the neck.
◆ The gap in the linea alba is approximated by interrupted absorbable suture.
◆ The skin is closed with interrupted monofilament polyamide sutures (Fig. 14.6).
Q. What is exomphalos?

Ans. Exomphalos is a rare congenital hernia occurring through the umbilicus and is due to failure of all or part of the midgut to return into the peritoneal cavity (Fig. 14.7).

Q. What are the linings of an exomphalos sac?

Ans. The sac covering the exomphalos may rupture during birth. The unruptured sac is transparent and is lined by outer amniotic membrane and the inner peritoneum.

Q. What is exomphalos minor?

Ans. When the umbilical defect is less than 4 cm, this is called exomphalos minor. This is also termed as herniation of the umbilical cord and a loop of small gut may remain in the sac and may be injured, if umbilical cord is ligated and divided in the usual way. The umbilical cord is attached to the summit of the sac.

Q. How will you treat exomphalos minor?

Ans. These small defects may be closed spontaneously soon after birth.
Q. What is exomphalos major?
Ans. When the fascial defect is more than 4 cm, this is called exomphalos major. The sac contains a large part of the small intestine and a part of the large intestine. The liver, spleen, and pancreas may be seen through the transparent membrane.

Q. When will you consider nonoperative therapy?
Ans. Premature infants with large defect are unlikely to withstand major operation, so a nonoperative treatment is indicated in such situation. The intact sac is painted daily with 2% mercurochrome lotion. An eschar forms over the sac and granulation tissue grows from the periphery. The subsequent ventral hernia is repaired at a later date when the child is fit for a major surgery (months to years later).

Q. What are the operative techniques for management of exomphalos major?
Ans. There are number of techniques for closure of the defect:
- **Skin flap closure**: The skin is freed from the fascial edges and undermined laterally. The skin margins are then apposed in the midline, if necessary, by release incisions in the flanks. The remaining ventral hernia is repaired at a later date.
- **Primary closure**: The skin is dissected away from the fascial margin. The intestine is decompressed both proximally and distally. The abdominal wall is stretched in all the quadrants manually. The herniated viscera are then replaced into the abdominal cavity and the fascial defect apposed in the midline. Care should be taken to monitor development of abdominal compartment syndrome.
- **Staged repair**: The skin margin is freed from the fascial attachments and a PTFE (polytetrafluoroethylene) mesh is sutured circumferentially in the margin of the fascial gap. The mesh is opened daily under aseptic condition and the viscera underneath is inspected and the mesh is tied again at a reduced level. This is continued daily till the fascial margins are lying closer. Once this is achieved, the fascial margins are apposed with interrupted sutures and the skin closed over the gap.

### PARAUMBILICAL HERNIA IN ADULTS

Q. What is your case? (Summary of a case of paraumbilical hernia)
Ans. This 45-year-old gentleman presented with a swelling around the umbilicus for last 3 years. The swelling was small about 2 cm in size at the onset but for last 3 years the swelling is gradually increasing in size and attained the present size. The swelling increases in size during walking and during strenuous activities and reduces in size on lying down. Patient complains of dull aching pain over the swelling for last 6 months. Patient underwent open cholecystectomy 5 years back. No other complaints are there (Fig. 14.8).

**Fig. 14.8**: Paraumbilical hernia

*Courtesy: Dr Nilanjan Panda, RG Kar Medical College, Kolkata*
On examination: On local examination, there is a swelling in the umbilical region. The whole umbilicus is stretched and thinned out. The swelling shows expansile impulse on cough. The swelling is reducible on lying down position and with slight manipulation of the contents. There is gurgling sound during reduction of the contents of the swelling. A gap of about 4 cm is palpable in the linea alba.

Q. What is your diagnosis?
Ans. This is a case of paraumbilical hernia.

Q. Why do you say this is a paraumbilical and not an umbilical hernia?
Ans. In adults, this hernia does not occur through the umbilical scar but occurs through the linea alba either above or below the umbilicus.

Q. What are the usual contents in a paraumbilical hernia?
Ans. The greater omentum is the most common contents. Apart from this small intestine, transverse colon or the urinary bladder may be a content of paraumbilical hernia.

Q. Why paraumbilical hernia is more common in females?
Ans. Increasing obesity, weakness of the abdominal muscles due to repeated pregnancy may be an etiological factor for development of a paraumbilical hernia in females.

Q. What are the complications of paraumbilical hernia?
Ans.
- **Irreducibility:** This may be due to the narrow neck of the sac or may be due to the adhesions of the contents within the sac.
- **Obstruction:** Intestinal obstruction may be due to adhesion of the gut within the sac or constriction of the gut at the neck of the sac.
- **Strangulation:** Unrelieved obstruction may lead to strangulation.
- **Intertrigo:** Obese patient with large hernia may have intertrigo. Ulceration in skin in-between redundant skin fold.

Q. How will you manage this patient?
Ans.
- **Weight reduction:** This is one of the important aspects before operation. Obese or overweight patients have more postoperative complication.
- Baseline workup to assess fitness for anesthesia.
- USG of abdomen to exclude any associated intra-abdominal pathology.

Q. What operation you will do in this case?
Ans. As the defect is large (4 cm in this patient), I will consider repair of this hernia with preperitoneal mesh placement.
- A transverse elliptical incision is made around the umbilicus.
- The skin and the subcutaneous tissue are dissected off from the rectus sheath to expose the neck of the sac.
◆ The hernial sac is opened at the neck and the contents are returned into the abdomen.
◆ If there are adhesions within the sac, the adhesions are lysed.
◆ The redundant sac is excised and the neck of the sac is closed with absorbable suture.
◆ A preperitoneal space is created by dissecting between the peritoneum and the posterior rectus sheath.
◆ A polypropylene mesh is placed in the preperitoneal space. The mesh should cover about 4 cm area all around the gap.
◆ The mesh is fixed to the anterior rectus sheath by interrupted sutures.
◆ The margins of the anterior rectus sheath are apposed in front of the mesh by nonabsorbable sutures.
◆ A suction drain is kept in the preperitoneal space.
◆ The skin is closed with interrupted monofilament polyamide sutures.

Q. What is anatomical repair?

Ans.
◆ If the defect is small (<3 cm) then an anatomical repair is feasible.
◆ The sac and its contents are tackled as above.
◆ The neck of the sac is closed with running absorbable suture.
◆ The margin of the fascial defect is apposed with interrupted nonabsorbable suture.
◆ Skin closed in usual way.

Q. How will you diagnose strangulation in a paraumbilical hernia?

Ans. Patient will present with irreducibility of the hernial mass and features of acute intestinal obstruction (pain abdomen, distension, vomiting, and absolute constipation). The pain may be severe.

On examination, there will be tachycardia, dehydration, and patient may be toxic.
Local examination will show that the hernial mass is irreducible and there will be both tenderness and rebound tenderness over the hernial mass. There is associated abdominal distension. Hyperperistaltic bowel sounds may be audible on auscultation.

Q. How will you manage strangulated paraumbilical hernia?

Ans. Resuscitation of patient with:
◆ Intravenous fluid
◆ Nasogastric aspiration
◆ Antibiotics
◆ Urinary catheterization
◆ Operation as soon as possible.

The hernial sac is exposed as described above. The hernial sac is opened at the fundus to drain the toxic fluid. The gangrenous content is exposed. If small intestine is gangrenous resection, anastomosis is done. If large gut is gangrenous, the gangrenous segment is excised and the segment is brought out as colostomy and a mucous fistula. The neck of the sac is widened and a formal hernia repair is deferred.
Q. What is your case? (Summary of a case of epigastric hernia)

Ans. This 50-year-old gentleman presented with a swelling in middle of the upper part of the abdomen for last 2 years. The swelling was 1 cm in size when the patient first noticed it 2 years back. Afterwards, the swelling is increasing slowly in size over this period. Swelling gets aggravated in size after strenuous activities and the swelling diminishes in size after patient takes rest. Patient complains of dull aching pain over the swelling for last 1 year. Patient experiences pain more toward the evening after strenuous activities and gets relief from pain with rest. Patient has no other complaints (Fig. 14.9).

On examination: There is a swelling in the midline about 6 cm below the xiphoid, globular swelling, 2 cm in diameter, free from the skin, and slight expansile impulse on cough. The swelling is partially reducible and the gap in the linea alba cannot be felt clearly. Abdominal examination is normal.

Q. What is your diagnosis?

Ans. This is a case of epigastric hernia.

Q. What is epigastric hernia?

Ans. Herniation through the linea alba anywhere between the xiphoid and the umbilicus is called an epigastric hernia.

Q. What is false epigastric hernia?

Ans. When there is protrusion of only extraperitoneal fatty tissue through the linea alba without any peritoneal pouch then it is called a false epigastric hernia.

Q. What is true epigastric hernia?

Ans. With protrusion of the extraperitoneal fat, a pouch of peritoneum may follow. When the epigastric hernia contains a peritoneal sac then it is called a true epigastric hernia.

Q. What are the usual contents of a true epigastric hernia?

Ans. Usually, the sac is very small and does not contain any viscus. The sac is either empty or may contain only omentum.

Q. What may be the cause of pain in patients with epigastric hernia?

Ans.

◆ Usually, the epigastric hernias are asymptomatic.
The patient may have dull aching pain over the swelling due to traction on the parietal peritoneum.
- The pain may also be due to strangulation of the contained omentum.
- The pain may be due to associated underlying peptic ulcer or gallstone disease.

**Q. How will you manage this patient?**

**Ans.** As the patient is having pain over the swelling and there is definite epigastric hernia, I will consider surgical treatment.

I will advise for:
- An upper gastrointestinal (GI) endoscopy to exclude an underlying peptic ulcer disease.
- A USG to exclude an underlying gallstone disease.
- Baseline investigation to assess patient fitness for anesthesia.

**Q. What operation will you do?**

**Ans.** I will do an anatomical repair of the defect.

- The operation is usually done under general anesthesia.
- A transverse incision is made over the swelling.
- The skin and subcutaneous tissue are dissected off from the anterior rectus sheath.
- The hernial mass is dissected all around the gap in the linea alba.
- The hernial sac is opened and any content is reduced.
- The neck of the hernial sac is closed with absorbable suture.
- The fascial defect in the linea alba is closed with interrupted nonabsorbable polypropylene suture.

If the defect is large (>4 cm), a polypropylene mesh is placed in the preperitoneal space and the fascial defect closed in front of the mesh with nonabsorbable polypropylene suture.

**FEMORAL HERNIA**

**Q. What is your case? (Summary of a case of femoral hernia)**

**Ans.** This 30-year-old lady presented with a swelling in her right groin for last 1 year, which gradually increasing in size. The swelling appears when the patient walks and does strenuous activities and reduces in size and sometimes disappears on lying down (Fig. 14.10).

*On examination,* there is a swelling in right groin. The swelling shows an expansile impulse on coughing. The swelling lies below and lateral to pubic tubercle and is reducible.

**Fig. 14.10:** Right-sided femoral hernia

*Courtesy: Dr Somak Krishna Biswas, NRS Medical College, Kolkata*
Q. What is the incidence of femoral hernia?
Ans. About 20% of hernia in women and 5% of hernia in men are femoral hernia.

Q. Through which anatomical defect femoral hernia emerges?
Ans. The hernia emerges through the Hesselbach’s triangle and then finds its way out through the femoral ring into the femoral canal and descends into the thigh through the saphenous opening.

Q. What is the boundary of femoral canal (Figs 14.11A and B)?
Ans.
- Femoral canal is a tunnel about 1.25 cm long and 1.25 cm wide at its base.
- This is the most medial compartment of the femoral sheath.
- This extends from femoral ring above to the saphenous opening below.
- Laterally separated from the femoral vein by a septum.
- The femoral canal is closed above by septum crurale and below by cribriform fascia.

Q. What are the contents of femoral canal?
Ans. It contains a deep inguinal lymph node (Cloquet’s lymph node) and lymphatics and loose areolar tissue.

Q. What is the boundary of femoral ring?
Ans.
- Anteriorly: Inguinal ligament
- Posteriorly: Cooper’s ligament, pubic bone, and fascia covering pectineus
- Medially: Lacunar ligament
- Laterally: By a septum separating the femoral vein.

Q. What is the differential diagnosis of a femoral hernia?
Ans.
- Inguinal hernia
Saphena varix
An enlarged Cloquet's node (conditions associated, i.e. enlargement of cloquet's node)
Lipoma
Femoral aneurysm
Psoas abscess pointing into the thigh
An enlarged iliopsoas bursa
Rupture of abductor longus
Hydrocele of a femoral hernia sac.

Q. What is Laugier’s femoral hernia?
Ans.
◆ It is the hernia through a gap in the lacunar ligament.
◆ Unusually, medially placed femoral hernia
◆ High chance of strangulation.

Q. What is Narath’s femoral hernia?
Ans.
◆ Hernia lies hidden behind the femoral vessels.
◆ Occurs in patient with congenital dislocation of hip due to lateral displacement of psoas muscle.

Q. What is Cloquet’s hernia?
Ans.
◆ Here the hernial sac lies behind the fascia covering pectineus muscle.
◆ High chance of strangulation.

Q. Why femoral hernia may develop following repair of inguinal hernia?
Ans. In repairs of inguinal hernia, which involve apposition of conjoint tendon and fascia transversalis to inguinal ligament, there may be tension on the fascia transversalis and it may pull up the inguinal ligament, thereby causing weakness of tissues of the femoral canal leading to herniation.

However, it may also be true that femoral hernia was missed during first operation.

Q. Why femoral hernia needs early operation?
Ans. The incidence of strangulation in femoral hernia is very high. About 30–45% of femoral hernia may undergo strangulation in 2 years’ time. The narrow and its tight femoral ring predispose to strangulation.

Q. What are the sites of constriction in strangulated femoral hernia?
Ans. The site of constriction may be at:
◆ Lacunar ligament
◆ Neck of the sac.

Q. How a patient of femoral hernia may present?
Ans. May present in the OPD:
◆ Lump in groin.
May present in the ER:

- Acute intestinal obstruction
- Strangulated hernia with pain, vomiting, tender, and irreducible swelling in groin.

**Q. What operation will you do?**

**Ans.** I will consider mesh repair of femoral hernia for this patient.

**Q. What is the technique of repair for a femoral hernia?**

**Ans.**

- The inguinal canal is exposed by a standard inguinal incision.
- The femoral hernia sac is dissected and the content reduced and the neck of the hernial sac is ligated and the redundant sac is excised.
- The femoral ring is closed by one or two interrupted polypropylene suture apposing the inguinal ligament to the Cooper’s ligament.
- A polypropylene mesh is then placed (15 cm × 7.5 cm) to reinforce the posterior wall of the inguinal canal.
- The mesh is then fixed below to the Cooper’s ligament medially and inguinal ligament laterally.
- Above the mesh is fixed to the conjoint tendon.
- Medially, the mesh is fixed to the lateral border of the rectus sheath and laterally the mesh is split to accommodate the round ligament or spermatic cord.
- The external oblique aponeurosis is apposed in front of the mesh.
- Skin is apposed with interrupted monofilament polyamide sutures.

**Q. What is the technique of McVay or Cooper’s ligament repair for femoral hernia?**

**Ans.**

- The operation is done under regional anesthesia.
- Groin crease incision above and parallel to the inguinal ligament.
- External oblique aponeurosis incised in the same line.
- Fascia transversalis incised medial to inferior epigastric vessels. The hernial sac is seen emerging through the femoral ring.
- The hernial sac is dissected from below the inguinal ligament and the sac delivered through the femoral ring.
- The hernial sac is opened and the contents of hernial sac reduced.
- The neck of the sac is ligated and redundant sac excised.
- The repair involves:
  - interrupted suture of polypropylene between the conjoint tendon and Cooper’s ligament medially.
  - In the middle 1–2 interrupted suture of polypropylene apposes inguinal ligament to Cooper ligament thereby closing the femoral ring.
  - Laterally, the conjoint tendon is apposed to inguinal ligament with interrupted polypropylene suture.
  - This type of repair closes the myopectineal orifice of Fruchaud.

**Q. What is low repair for femoral hernia?**

**Ans.**

- Femoral hernia may be tackled by a low operation (Lockwood technique).
◆ The incision is located in the medial aspect of the thigh below the inguinal ligament centering over the femoral canal.
◆ The subcutaneous fat is incised to expose the hernial sac.
◆ The hernial mass is dissected all around the inguinal ligament, Cooper’s ligament, and the neck of the hernial sac is delineated by gauge dissection. The sac is dissected beyond its neck up to the fundus.
◆ The sac is opened, contents inspected, and reduced into the peritoneal cavity. Neck of the sac may be digitally dilated to facilitate reduction. If the neck of the sac is very tight—lacunar ligament may need to be incised to facilitate reduction of hernial content. Abnormal obturator artery is to be taken care of while incising the lacunar ligament.
◆ The sac is ligated by transfixation at the neck and redundant sac is excised.
◆ The margin of the femoral ring is well delineated.

The repair is done with 2-0 polypropylene suture apposing the inguinal ligament to Cooper’s ligament with few interrupted suture or by a purse string suture closing the femoral ring.

**LUMBAR HERNIA**

**Q. What is your case? (Summary of a case of lumbar hernia)**

**Ans.** This 30-year-old gentleman presented with a swelling in the upper part of the left loin for last 2 years. The swelling was about 2 cm in size at the onset but for last 2 years, it is gradually increasing in size to attain the present size of about 5 cm. The swelling appears only on standing, walking, and on strenuous activities and disappears spontaneously on lying down position. Patient complains of occasional dull aching pain over the swelling for last 1 year (Fig. 14.12).

*On examination:* With the patient standing, there is a swelling in the left loin just below the 12th rib. There is expansile impulse on cough over the swelling. The swelling is easily reducible on lying down. A gap is felt in the region superior lumbar triangle.

**Q. What is your diagnosis?**

**Ans.** This is a case of left lumbar hernia through superior lumbar triangle.

**Q. What is the boundary of the inferior lumbar triangle?**

**Ans.** The inferior lumbar triangle of Petit is bounded:
◆ *Below*—by the iliac crest
◆ *Medially*—by the latissimus dorsi
◆ *Laterally*—by the external oblique muscle.

*Fig. 14.12:* Left-sided lumbar hernia through superior lumbar triangle

*Courtesy: Dr Sarvesh Gupta, IPGME and R, Kolkata*
Q. What is the boundary of the superior lumbar triangle?
Ans. The superior lumbar triangle is bounded:
◆ Above—by the 12th rib
◆ Medially—by the sacrospinalis muscle
◆ Laterally—by the posterior border of the internal oblique muscle.

Q. What are the other possibilities of such a swelling?
Ans.
◆ Lipoma
◆ Neurofibroma
◆ A cold abscess.

Q. How will you treat this patient?
Ans. As there is a tendency for this hernia to increase in size with time, I will consider surgical treatment. It is difficult to close the gap by apposing the local tissue. So, a repair using a polypropylene mesh is preferred.

PERSISTENT VITELLOINTESTINAL DUCT

Clinical Examination

History
◆ Discharge from the umbilicus. Duration, quantity, and type of discharge [in patent vitellointestinal duct (VID), mother usually complains of feculent discharge through the umbilicus since birth].
◆ Any mass protruding through the umbilicus (in patent VID, a reddish mucosal tag may protrude through the umbilicus).

Examination—Inspection/Palpation
◆ Assess the type of discharge
◆ Examination of the umbilicus to look for any protruding mucosal tag
◆ Look for any other congenital anomalies.

Q. What is your case? (Summary of a case of persistent vitellointestinal duct)
Ans. This 1-year-old male child presented with mucous and occasional feculent discharge through the umbilicus since birth. Mother also says that there is a reddish mass protruding from the umbilicus for last 6 months (Fig. 14.13).

On examination: There is slight feculent discharge through the umbilicus. A reddish mucous membrane is seen prolapsing through the umbilicus.

Fig. 14.13: Persistent vitellointestinal duct
Courtesy: Dr BN Mukhopadhyay, NRS Medical College, Kolkata
Q. What is your case?
Ans. This is a case of fecal fistula due to persistent VID.

Q. What is vitellointestinal duct?
Ans. This is a tubular diverticulum, which extends from the midgut to the extraembryonic part of the yolk sac. During normal development, the VID disappears.

Q. What are the different abnormalities of vitellointestinal duct?
Ans. The VID may show following developmental abnormalities:
- **Patent VID**: The VID persists completely and leads to a fecal fistula (Fig. 14.14A).
- **Raspberry tumor or umbilical adenoma**: The major part of the VID disappears except a small part near the umbilicus. The mucous lining of the distal part of the VID at the umbilicus gives rise to a raspberry tumor (Fig. 14.14B).
- **Enterocystoma**: The proximal and the distal part of the VID disappear but the intervening part remains patent. This unobliterated intermediate part of VID gives rise to cystic swelling known as enterocystoma (Fig. 14.14C).
- **Meckel's diverticulum**: The proximal end of the VID remains patent and the rest disappears. This leads to formation of Meckel's diverticulum (Fig. 14.14D). The tip of the Meckel's diverticulum may be free or may remain attached to the umbilicus by a fibrous cord, which is the obliterated distal part of the VID (Fig. 14.14D).
- **Fibrous cord**: The lumen of the VID gets obliterated, but it persists as a fibrous cord running between the ileum and the umbilicus. This fibrous band may cause intestinal obstruction (Fig. 14.14E).

Figs 14.14A to E: Different abnormalities of vitellointestinal duct.
Q. How will you manage this patient?
Ans. I would like to do a fistulogram to confirm that the tract is continuous with the intestine.
- I will do baseline investigations (complete hemogram, blood sugar, urea, creatinine, and a chest X-ray).
- I will go for an umbilectomy with total excision of the VID with a wedge of ileum and end-to-end anastomosis of the cut margin of the ileum.

Q. What are the other causes of fecal discharge through the umbilicus?
Ans. Fecal fistula through the umbilicus may result due to:
- Abdominal tuberculosis
- Crohn’s disease
- Neoplastic disease: Carcinoma colon or small gut infiltrating the umbilicus
- Intra-abdominal abscess may point to the umbilicus resulting in fecal fistula.

UMBILICAL ADENOMA OR RASPBERRY TUMOR

Q. What is your case? (Summary of a case of umbilical adenoma or raspberry tumor)
Ans. This 10-year-old male child presented with a swelling in the umbilicus for last 6 months. The swelling is static and has not grown in size since onset. Patient complains of slight mucus discharge from the umbilicus for the same duration. He has no other complaints.

On examination: There is a soft pinkish mass in the umbilicus 1 cm × 1 cm, there is mucus discharge from this mass and bleeds on touch. No other mass is palpable in the abdomen.

Q. What is your diagnosis?
Ans. This is a case of raspberry tumor of umbilicus.

Q. What is raspberry tumor?
Ans. This is not actually a neoplastic lesion. This results from the unobliterated distal portion of the VID. The mucosa of the unobliterated distal part of the VID near the umbilicus prolapses through the umbilicus and gives the appearance of a raspberry like tumor.

Q. What other condition may be associated with this?
Ans. Raspberry tumor may be associated with presence of Meckel’s diverticulum.

Q. How will you investigate for presence of Meckel’s diverticulum?
Ans.
- Barium meal follow through examination or small-bowel enema examination
- 99mTc scan.

Q. How will you treat this patient?
Ans. I will consider umbilectomy and excision of the raspberry tumor.

Q. Would you like to do routine laparotomy?
Ans. Some surgeon advocate routine laparotomy to excise associated Meckel’s diverticulum.
Laparotomy has to be done in patients where there is presence of a Meckel's diverticulum for excision of the associated Meckel's diverticulum.

**Q. What is endometrioma?**

**Ans.** This is a condition where there is presence of ectopic endometrial glands in the umbilicus. This appears as a fleshy mass in the umbilicus, which becomes painful and discharges blood during each menstrual cycle. This may be associated with endometriomas in ovary or uterus.

**Q. What is the treatment for endometrioma?**

**Ans.** Umbilicectomy with excision of the endometrioma.

If associated with endometriosis of uterus and ovary, Danazol therapy may help.

**URACHAL FISTULA**

**Q. What is your case? (Summary of a case of urachal fistula)**

**Ans.** This 8-year-old male child presented with intermittent watery discharge from the umbilicus for last 2 years. The discharge smells of urine. Patient has no other complaints.

On examination, there is uriniferous discharge from the umbilicus. External genitalia is normal. No lump is palpable in the abdomen.

**Q. What is your diagnosis?**

**Ans.** This is a case of urinary fistula due to patent urachus in a boy of 8 years of age.

**Q. What is allantois?**

**Ans.** Allantois is a diverticulum found in embryo, which passes through the umbilicus from the cloaca to the placenta.

**Q. What happens to the allantois?**

**Ans.** The allantois forms the bladder except the trigonal area. The part of the allantois from the apex of the urinary bladder to the umbilicus forms the urachus. The urachus also disappears during development into a fibrous cord and forms the median umbilical ligament.

**Q. How does urachal fistula develop?**

**Ans.** The urachus instead of obliteration may remain patent leading to formation of a urachal fistula. A patent urachus may not result in urinary fistula unless there is an associated bladder outlet or urethral obstruction.

**Q. Why patient usually presents in late age?**

**Ans.** The patent urachus does not result in urinary fistula in all cases. The urinary fistula is manifested only when there is an associated lower urinary tract obstruction like, e.g. posterior urethral valve, stricture urethra, bladder neck obstruction, or prostatic enlargement.

**Q. What is urachal cyst?**

**Ans.** Urachal cyst develops due to persistence of the central portion of the urachus and presents as a cystic swelling in the hypogastrium.
Q. How will you manage this patient of urachal fistula?
Ans.
♦ Before excision of the urachal fistula is considered any associated lower urinary tract obstruction needs to be excluded.
♦ A USG of kidneys, ureters, and bladder (KUB) region will reveal any back pressure changes in the urinary bladder, ureter, or the kidneys due to distal obstruction.
♦ An intravenous urography with voiding cystourethrography will diagnose any associated posterior urethral valve.

Q. If there is associated posterior urethral valve, what will you do?
Ans. Cystoscopic fulguration of the posterior urethral valve will relieve the urethral obstruction. This may result in spontaneous closure of the urachal fistula.

Q. If the urachal fistula is persistent, how will you treat?
Ans. Umbilicectomy with excision of the urachus up to the apex of the urinary bladder. The apex of the bladder is to be repaired with polyglycolic acid suture.

DESMOID TUMOR IN THE LOWER ABDOMINAL WALL

Summary of a Case of Desmoid Tumor in the Lower Abdominal Wall

This 45-year-old lady presented with a swelling in her lower abdomen for last 2 years. The swelling was initially increasing slowly in size, but for last 6 months, the swelling is increasing rapidly to attain the present size. He complains of dull aching pain over the swelling for last 6 months. Patient has no other complaints.

On examination: There is a swelling in the umbilical, hypogastric, and right iliac fossa region, the swelling is parietal as evidenced by rising test, firm in feel, the surface is irregular, margins are well defined and rounded, the swelling is mobile from side to side and slightly from above downward, the swelling is free from the overlying skin. Liver and spleen are not palpable and there is no other mass in the abdomen.

Q. What is your diagnosis?
Ans. This is a case of desmoid tumor in the lower abdominal wall.

Q. What is desmoid tumor?
Ans. This is a benign tumor arising from the musculoaponeurotic structures of the rectus sheath. Although grouped as benign, the tumor has high potential of local recurrence following excision. This tumor is commonly found in the infraumbilical abdominal wall, but may also arise from the musculoaponeurotic structures in the region of shoulder, thigh, buttocks, and chest.

Q. How will you treat this patient?
Ans. I will advise a USG of the abdomen to ascertain the nature of the swelling.
♦ Routine preoperative workup
♦ I will consider wide excision of the tumor with a 2.5 cm margin of healthy tissue. The defect of the abdominal wall is made good by placement of a PROLENE mesh.
Q. Why such wide excision is necessary?
Ans. Desmoid tumors have notorious tendency for local recurrence following excision. So, a wide margin of excision is necessary to reduce the incidence of local recurrence.

Q. What are the pathological features of desmoid tumors?
Ans.
- A slow growing benign fibroma
- Nonencapsulated and locally invasive
- Histologically consists of mature fibrous tissue
- There are multinucleated plasmodial masses resembling foreign body giant cells
- May undergo myxomatous degeneration
- Unlike fibroma at other sites, it does not undergo sarcomatous change.

Q. What are the important etiological factors for development of desmoid tumor?
Ans.
- 80% cases occurs in multiparous women
- May occur in previous abdominal scars
- Trauma due to repeated pregnancy, or a small hematoma of abdominal wall may be an etiological factor
- Desmoid tumor may be associated with familial polyposis coli (Gardner’s syndrome).