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Essentials of

Obstetrics

Lakshmi Seshadri • Gita Arjun



Wolters Kluwer

Essentials of Obstetrics

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Preface

A medical student is on a journey of discovery. Every day of his or her progress through medical education is crowded with, overwhelming amount of information. The young student struggles hard to not only acquire and assimilate knowledge but also reproduce that knowledge in examinations. An ideal textbook, therefore, should help him or her on both counts; it should make knowledge easy to acquire and exciting, and also help the student replicate it in an examination.

In the course of our medical education, some textbooks will always stand out in our minds. A book that introduces us to a completely new subject and fans the embers of curiosity to explore and learn more, is priceless. The authors have clearly poured their passion into the book and succeeded in bringing alive all the intricacies of the subject.

For students of Medicine, learning never stops. It is a lifelong process that involves years of dedication to the gathering of knowledge from textbooks, journals, and from clinical experiences. Both the novice student and the practicing clinician can be overwhelmed by the vast amount of information that is currently available. Information is easily assimilated only when it is put together in a concise, simple, and easy-to-read format.

Authoring a textbook with an undivided focus on the student and his or her needs is daunting. As authors, the onus is upon us to make sure that the facts presented to the student are evidence based and clinically applicable. To this end, we have researched every piece of information before including it in the text. On the other hand, it is imperative that the book spurs the student to learn more without being intimidated by the subject matter.

A student cannot grow to become a good practitioner without a thorough understanding of the pathophysiology of diseases. Skills in diagnostic evaluation and management must follow. We have ensured this pattern in the book so that the subject is presented in a cogent fashion. Clinical guidelines which are tailored to the needs of the population we deal with have been emphasized and included at appropriate places.

Each chapter begins with a commonly seen clinical case scenario pertaining to the topic of the chapter and goes on to introduce the topic, explain and illustrate the relevant concepts, and closes with self-assessment. The questions based on the case scenarios are answered at the end of the chapter.

Keeping in mind that examinations are a major challenge in a student's life, the details are presented in Boxes, Tables, Flowcharts, and Figures (line illustrations and clinical images). Figures have simple explanations placed along with the captions. These visuals are of immense help during revision. Besides, the Key Points section at the end of the chapter presents the entire chapter in a nutshell—this feature too is useful in quick recapitulation of essentials.

The Boxes and Tables introduced in the sister volume, *Essentials of Gynecology* (authored by Prof Lakshmi Seshadri), have been a huge success with students. Naturally, we have retained these features in this book as well.

The book is a joint effort by the two of us but with unstinting and generous help and support from our family, colleagues, former and current students, and friends. We are indebted to the editorial team at Wolters Kluwer for their professional inputs.

Lakshmi Seshadri
Gita Arjun



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Essentials of Obstetrics has been a collaborative effort between the two of us. Our greatest inspiration and motivation for writing this book has come from the widespread appreciation of *Essentials of Gynecology* by undergraduate and postgraduate students, teachers, and colleagues and, of course, a request for the companion volume.

We would like to place on record our sincere thanks to those who have supported, encouraged, and helped us in several ways. We would like to thank Dr S Suresh and his team at Mediscan Systems, Chennai, for their generous contribution of ultrasonographic images. The colorful clinical photographs are from our former student, Dr Rajnish Samal, Bangalore, and also from the team at Seethapathy Clinic and Hospital, Chennai. Some of the laparoscopic images were provided by Dr Sandip Datta Roy. The cardiocography traces, partographs, and images were provided by Dr Santosh Benjamin and the postgraduate students of Christian Medical College, Vellore. We gratefully acknowledge their help.

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The team at Wolters Kluwer: Mrs P Sangeetha, Manager, Commissioning; Dr Vallika Devi Katragadda, Consultant; and Mrs Pooja Chauhan, Manager, Prepress; has worked tirelessly to make this book a possibility and a dream come true. We are indebted to them for their support and contribution. We are thankful to Mr P Saravanan and his team at Digiprezz Media Solutions, for excellent composition and to Mr S Kartikeyan, for beautiful illustrations. Their co-operation and hard work are truly appreciated.

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Gita Arjun

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Section 1

Basic Science in Obstetrics

1

Anatomy of the Female Reproductive Tract

Case scenario

Mrs. AV, 24, primigravida was admitted to labor room at term. Labor was augmented with oxytocin for dysfunctional labor. Second stage of labor was prolonged; therefore, baby was delivered by forceps after pudendal block. There was a fourth degree perineal laceration. Consultant obstetrician was called in to perform an accurate anatomical perineal repair.

Introduction

A comprehensive knowledge of the anatomy of the reproductive tract, changes in the anatomy in pregnancy, the anatomy of the bony pelvis, different pelvic configurations, and the anatomy of the fetal skull is essential for understanding the mechanism of labor and managing problems that arise during pregnancy and labor.

Anterior abdominal wall

Consists of the following layers:

- Skin
- Subcutaneous fascia
- Rectus sheath

- Muscles
- Peritoneum

Skin

Skin of the anterior abdominal wall stretches in pregnancy. There is pigmentation along the midline forming linea nigra. Stretch marks that develop in pregnancy are known as *striae gravidarum*. The Langer's lines or dermal fibers are arranged transversely.

Subcutaneous tissue

Consists of superficial fatty layer or Camper's fascia and deep membranous layer or Scarpa's fascia.

Rectus sheath

Rectus sheath is formed by the aponeurosis of external and internal oblique and transverse abdominis muscles. This sheath covers the rectus abdominis muscle. Midway between umbilicus and pubic symphysis is the arcuate line. The formation of the rectus sheath is different above and below the arcuate line. Above the arcuate line, the internal oblique aponeurosis splits into two layers: the anterior layer fuses with the external oblique aponeurosis and the posterior layer fuses with transverse abdominis aponeurosis to form the anterior and posterior rectus sheath, respectively. Below the arcuate line, the aponeuroses of the internal oblique and transverse abdominis fuse with the external oblique aponeurosis anteriorly to form anterior rectus sheath (Fig. 1.1).

Muscles

The muscles of the anterior abdominal wall are:

- External oblique
- Internal oblique
- Transverse abdominis
- Rectus abdominis
- Pyramidalis

The fibers of the internal oblique and transverse abdominis become aponeurotic more medially than external oblique. Therefore, these muscle fibers may have to be cut laterally while making a transverse incision. The rectus

abdominis muscles lie on either side of midline. Transverse incisions for cesarean section are usually extended up to the lateral border of these muscles. Pyramidalis is visualized when the anterior rectus sheath is dissected from the muscle near the pubic symphysis. These small muscles may be left attached to the rectus sheath.

Peritoneum

This is part of the parietal peritoneum that covers the abdominal cavity.

Blood supply

Blood supply is from branches of femoral and external iliac arteries (Box 1.1).

The superficial epigastric vessels are encountered during transverse (*Pfannenstiel*) incision in the subcutaneous tissue. The inferior epigastric vessels are larger and lie posterior to the rectus muscle. These have to be identified and ligated or cauterized.

Box 1.1 Blood supply of the anterior abdominal wall

- Branches from femoral artery
 - Superficial epigastric
 - Superficial circumflex iliac
 - External pudendal
- Branches from the external iliac artery
 - Deep (inferior) epigastric
 - Deep circumflex iliac

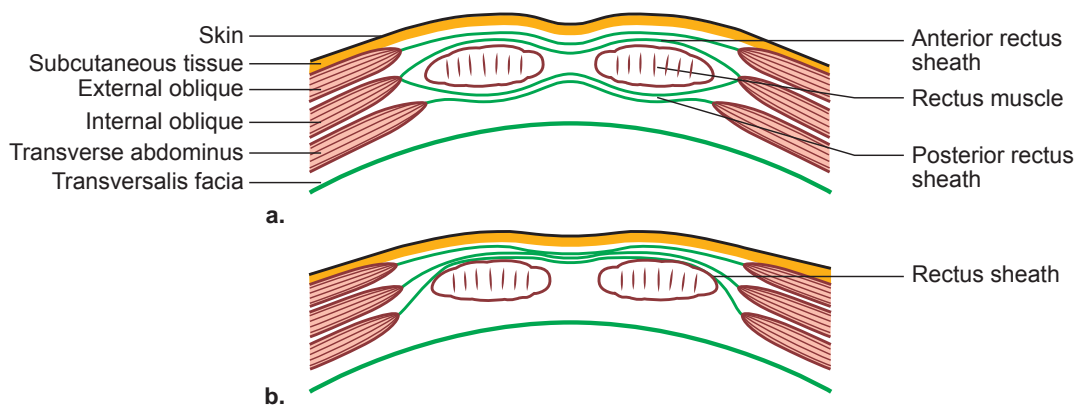


Figure 1.1 The rectus sheath. **a.** Above the arcuate line. The internal oblique aponeurosis splits into two layers. **b.** Below the arcuate line. The aponeuroses of internal oblique and transverse abdominis fuse with external oblique aponeurosis.

Clinical implications

Incisions on the abdominal wall for cesarean section may be vertical midline or Pfannenstiel. Vertical incisions are associated with more postoperative pain and higher risk of incisional hernia; hence, transverse incisions are preferred. Other clinical implications (advantages and surgical anatomy) of *transverse incision* are given below.

- Advantages
 - Performed along Langer’s lines
 - Cosmetically better
 - Less pain
 - Less risk of hernia
- Surgical anatomy
 - Lateral extent of transverse incision
 - Up to lateral border of rectus abdominis
 - Inferior epigastric vessels
 - Lie under rectus muscles
 - Must be clamped/cauterized
 - Ilioinguinal/Iliohypogastric nerve fibers
 - May be entrapped/divided in transverse incision

Nerve supply

Innervation is by T7–T12 and L1. Abdominal wall at the level of the umbilicus is supplied by T10. Ilioinguinal and iliohypogastric nerves (L1) supply the suprapubic area, lower abdomen, and mons pubis. These nerve fibers run between the layers of rectus sheath lateral to the rectus

muscle and may be entrapped or divided if the transverse incision extends too far laterally.

External genitalia (vulva)

Vulva or the external genitalia consists of anatomical structures listed in Box 1.2 (Fig. 1.2).

Mons pubis

This is the triangular area anterior to the pubic bones; it is continuous with the abdominal wall above and with the labia below. It is filled with adipose tissue and covered by hairy skin.

Box 1.2 External genitalia (vulva)

- Mons pubis
- Labia majora
- Labia minora
- Clitoris
- Vestibule
- Urethral orifice
- Vaginal orifice
- Hymen
- Bartholin’s glands
- Skene’s glands
- Vestibular bulbs

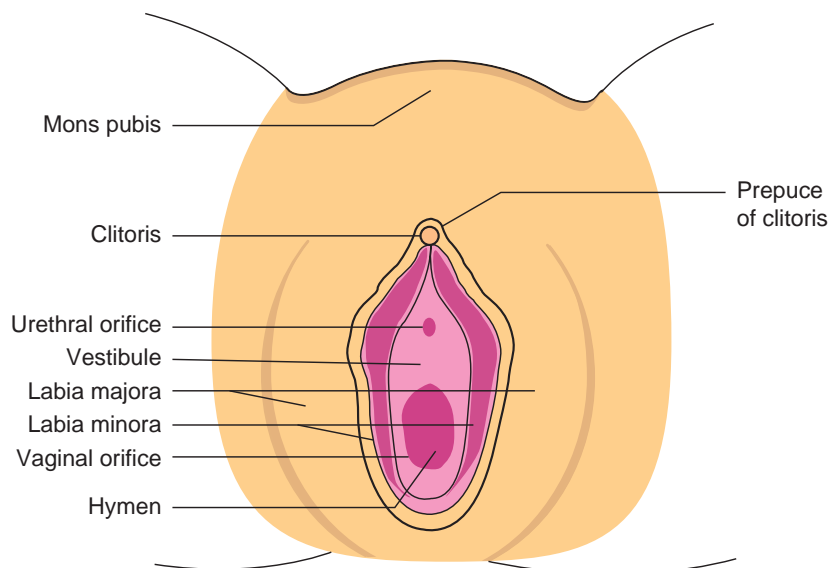


Figure 1.2 Structures in the vulva.