

(双语版)

Introduction to Basic Surgical Skills

外科基本操作导论

(高等医学院校教材)

汤文浩 刘志勇 主编



东南大学出版社
SOUTHEAST UNIVERSITY PRESS

第2版

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丁海明 王学军 主编

第2版 2016年1月第1次印刷



ISBN 978-7-309-06000-0

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· 南京 ·

内 容 提 要

外科基本操作是每位临床医学专业学生的必修课。本教材是按 48 学时(12 次实验,每次 4 学时)编写的一本外科基本操作指导性教材,内容包括无菌术、外科基本操作(切开、止血、结扎、缝合)、腹腔镜基本操作、创伤急救基本技术、心肺复苏基本技术和动物模拟手术训练等。

本书可以作为医学院各专业的医学生学习外科基本操作的指导教材。

图书在版编目(CIP)数据

外科基本操作导论 / 汤文浩, 刘志勇主编. —南京:
东南大学出版社, 2013. 1

汉英双语教材

ISBN 978-7-5641-4065-6

I. ①外… II. ①汤… ②刘… III. ①外科手术—操
作—双语教学—高等学校—教材 IV. ①R615

中国版本图书馆 CIP 数据核字(2012)第 318790 号

外科基本操作导论

出版发行: 东南大学出版社

社 址: 南京市四牌楼 2 号 邮编: 210096

出 版 人: 江建中

责任编辑: 戴坚敏

网 址: <http://www.seupress.com>

电子邮箱: press@seupress.com

经 销: 全国各地新华书店

印 刷: 南京玉河印刷厂

开 本: 787mm×1092mm 1/16

印 张: 12.5

字 数: 326 千字

版 次: 2013 年 1 月第 1 版

印 次: 2013 年 1 月第 1 次印刷

书 号: ISBN 978-7-5641-4065-6

印 数: 1~3 000 册

定 价: 35.00 元

本社图书若有印装质量问题,请直接与营销部联系。电话:025-83791830

Introduction to Basic Surgical Skills

Bilingual Edition

(A Guide Book for Undergraduate Surgical Education)

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前 言

飞行员在驾驶飞机离地之前就可以有娴熟的飞行技能,他们是通过高仿真飞行模拟器获得这些技能的。在外科学学习曲线的初期阶段,我们也可以采用类似的模拟训练方法。本书的目的就是为初学者创立一个外科技能训练课程,使医学生在进入手术室之前就能掌握一些基本手术技能,缩短在真实病人身上的学习曲线,减少不必要的手术技巧方面的并发症,缩短手术用时。本课程的训练包括桌面实验、盒式训练器和动物实验等。

为了培养正确、精细的外科操作技术,我国医学院在课程设置中已经将外科基本操作归入必修课,并且纳入评估体系。该课程一般在医学院的三年级开课,旨在按课程设置要求介绍外科基本操作技巧,要求学生通过外科手术基本操作的强化训练,打好外科手术操作的基础。实践证明,许多外科技巧可以在外科实验室内讲授,医学生可以通过用动物器官或用活体动物进行外科技术训练,并结合计算机辅助教学及视频,提高手术技能。

手术是一种团队工作。本课程要求学生以小组(通常4~5人为一组)为单位,进行强化动手操作训练。在我国医学院校中,该课程的教学内容主要包括无菌术、外科基本操作技术和心肺复苏基本技术三方面。尽管外科无菌技术和手术基本操作的基本原则相同,但具体方法各院校仍有差异。为了履行以能力为导向的外科技能培养方案,本书列出了5种动物模拟手术操作,目的是让每个学生都有操作机会。结合我院具体情况,我们作了适当调整。在5次手术中,安排了2次小肠部分切除端一端吻合术,旨在将无菌技术与手术操作相结合,要求学生在执行无菌技术的前提下,对外科手术基本操作(切开、分离、止血、结扎、缝合)有多练的机会,从而打好外科操作的基础。

汤文浩 刘志勇

2012年重阳节于南京丁家桥87号

PREFACE

Airline pilots become proficient at flying an aeroplane before even leaving the ground, acquiring skills on a high-fidelity flight simulator. The analogous situation should be possible for the early part of the learning curve in surgery. The aim of this booklet was to develop a beginner-based surgical skill training program for the initial acquisition of technical skill, leading to a basic level of proficiency prior to entering the operating theater and reducing their learning curve on real patients. This may lead to a reduction in the number of unnecessary complications occurring due to a failure of technical skills, and the time spent in the operating room. Basic and procedural tasks can be simulated in a bench, box trainer or animal model environment.

In order to provide training on correct, delicate and precise surgical techniques, the basic surgical skill training course is integrated in the Medical Curriculum as a mandatory requirement for the students major in clinical medicine in China. This training course is usually undertaken within the 3rd academic year of medical students in University, offers an introduction to fundamental surgical skills required by Medical Curriculum and focuses on training students to acquire a higher level of basic skills in open surgery by means of intense laboratory practice. Evidence shows that many surgical skills can be taught in the environment of a surgical skills laboratory. Medical students can develop and improve their surgical skills by participating in workshops that combine the use of animal organs, live animals, computer-aided learning programs and videotapes.

Surgery is a team work. The emphasis of this course is on small group (usually 4 to 5 students) working, intensive hands-on practice of basic skills and the performance of practical procedures. Although there are minor variations in the way that basic surgical skills are taught to medical students at medical schools in China, three modules are undertaken over the forty-eight hours of the course: surgical aseptic techniques, basic surgical skills in open surgery and basic skills in cardiopulmonary resuscitation, especially for trauma patients. To implement a competency-based surgical skills curriculum, training of basic surgical skills was considered an important learning goal in the operative field. Thus, in our school, repeating Session 10 twice was integrated with focus on enhancing basic suturing techniques on animal models, although four different hands-on training programs on animal models have been offered in this book.

Wen-hao Tang
Zhi-yong Liu

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Course Overview

Surgery treats illness by manual or operative methods. Although there is quite a different kind of surgeries involved in a variety of surgical specialties, there are common basic aseptic rules and surgical elements such as instrument-handlings, incision, exposure, dissection, hemostasis, ligation (knot tying) and suture, which will be implemented and studied using examples from different subject matters such as the use of nonsynthetic materials and animals. The ethos of the Basic Surgical Skills course is to install core surgical skills and develop aseptic methods at the very beginning of a surgeon's training by teaching the correct basic technique.

The surgical skills training and education laboratory is a state-of-the-art educational facility that provides an environment to teach fundamental technical skills and procedures, where students can learn and hone their technical skills prior to performing procedures on a real patient.

Students entering the Surgical Skill Lab should rigorously adhere to the same principles of asepsis as surgeon entering the human operating room (OR), which is the foundation of surgical site infection prevention. Pay serious attention to all the steps in the practice, provide care for animals (humaneness for the animals) and prevent animal from anesthetic accident, surgical site infection and accidental death.

A. INSTRUCTION FOR STUDENTS ENTERING THE SURGICAL SKILL LAB

1. People dressed in street clothes or clothes worn elsewhere about the campus are not appreciated to enter the Surgical Skill Lab and a clean white smock or coat is recommended.

2. You must change into clogs or sandals at the barrier between the Lab and the rest of the campus.

3. Before entering the Lab, you need to enter the changing room, where you should put on a cap/hood and make sure it completely covers your hair, the scalp line and sideburn (Fig. 0-1). A face mask must be up over the nose, if it fogs your glasses, arrange its top edge, so that your breath does not drift upwards, or, rub your glasses with ordinary soap and polish them. Then you must change into a scrub suit, consisting of pants and a short sleeved shirt. The shirt is tucked inside the trousers, not allowed to hang loosely

(Fig. 0-2). Underwear should be made of cotton. Other material such as silk, wool, nylon, dacron, orlon, and rayon can carry a high electric charge. A spark from these can be very dangerous in the presence of the highly inflammable anesthetic gases. A clean scrub suit is donned whenever personnel enter the restricted or semirestricted area of the operating room.

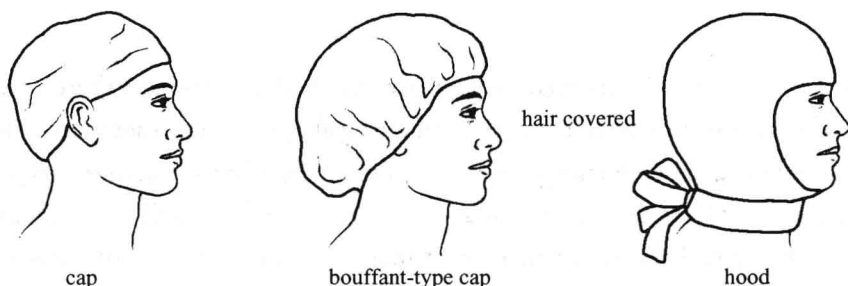


Fig. 0-1 Hair cover types

图 0-1 戴帽遮发

4. Be serious in the practice and follow teacher (program directors)'s instruction. Talking is kept to a minimum during surgery. No loud talking, no laughing, no shouting or crying out.

5. Surgery is a collaborative effort. Each member of the team has specific duties and tasks that complement the other members and achieve common goals.

6. Surgery requires extreme concentration and a high sense of responsibilities. Although it is a skill training course on animal models, carelessness or perfunctoriness is not accepted.

7. When the surgery is completed, soiled instruments should be cleaned, washed, disinfected, dried, lubricated, packaged and then taken to the sterilization room.

8. Before leaving the operating room after an infected case, personnel should put gloves, caps, masks and gowns in the containers provided specifically for this purpose. Soiled scrub suits must be placed in a marked laundry receptacle so that they do not spread contamination.

9. Practice strict economy, keep the operative environment clean and tidy, take good care of surgical instruments, equipments and furniture.

10. A perfect knot tying requiring a great deal of practice, each student will practice the knot tying by means of several homework assignments. Take your time when learning

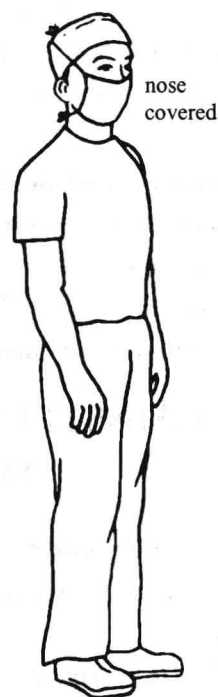


Fig. 0-2 OR (operating room) attire

图 0-2 手术室的着装

these skills. It is better to be methodical and slow at first. Speed and efficiency will follow with practice if you use the same technique repeatedly. After each session of hands-on training on animal models, students are expected to write lab protocols; making anesthesia note by anesthetist and dictating operative and postoperative reports by surgeons, referring to Appendix 3. Certification of successful completion is based on following skills assessments: knot tying, aseptic techniques (scrubbing, gloving and gowning), cardio-pulmonary resuscitation and medical records writing.

B. OPERATING ROOM PERSONNEL

Each member of the team has a clearly assigned role and responsibility. Students will work in small groups preparing and operating on animals, but they are encouraged to work in a cooperative way to complete performance objectives, demonstrating integrity and holistic view.

1. Surgeon (operator) usually stands on the right side of patients (Fig. 0-3) and is responsible for operation, including incision, dissection, homeostasis, ligature and suture, under the prescribed policies or according to intraoperative events, directs the surgical team during the procedure.

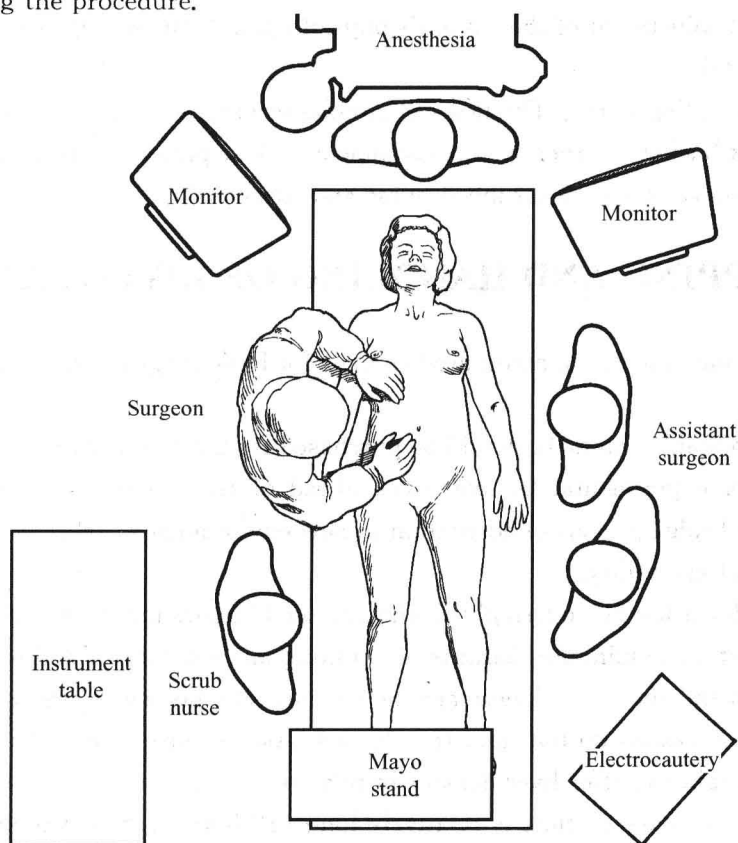


Fig. 0-3 Positioning of the sterile team members and the furniture

图 0-3 手术组人员和设施的位置

2. The first assistant, scrubbing ahead of operator, may perform surgical skin preparation, works with scrubbed nurse to unfold the drapes over patient, stands on opposite side to surgeon and is responsible for hemostasis and sucking blood during the procedure.

3. The second assistant, standing by the operator or the first assistant, is responsible for holding retractors, cutting thread and sucking blood.

4. Scrubbed nurse scrubs before the rest of the sterile team to prepare all sterile supplies and equipment that have been previously opened. Scrub nurse, usually standing adjacent to the operator at about the level of the thighs, is responsible for instruments and its delivery, needle-threading, sutures, devices, solutions, and medications according to the specific surgery, maintaining a clean and orderly managed instrument table and sterile field, protecting the surgical setup from contamination, and performing the initial instrument, sponge, and needle count with the circulator.

All items that could be retained in the surgical wound are counted by two people in a prescribed manner. Policies directing sponge, sharps, and instrument counts (called simply a count) have been established. The count is performed before surgery begins to establish a baseline count, before closure of a cavity, and before skin closure.

5. Anesthetist: Anesthetist is responsible for anesthesia, meticulous assessment, monitoring, and adjustment of the patient's physiological status during surgery. Stands on the head of the table.

6. The circulating nurse: The tasks of circulator were as follows: to fetch and carry, to place the kick bucket or other sponge receptacle in close proximity to the sterile field, to participate in count, to secure scrubbed nurse and surgeons' gowns.

C. TRAPPING AND HANDLING OF LIVING ANIMALS

Dogs or rabbits are the common used animals for basic surgical skill training in Southeast University.

1. If it is possible, animals should be purchased from a supplier and moved to the cages or kennel of experimental lab one week ahead of the studies, especially for dogs, which serves to bridge periods of adaptation to new environments, thereby reducing stress and experimental variability.

2. Except for drinking, overnight fasting allows 12 hours for emptying of the stomach before the operation to minimize hazards of vomiting and aspiration, and to help exposure and operation in the abdomen. These are the reasons why fasting is appropriate for a dog or cat, but these reasons do not hold true for rabbits, because rabbits lack the vomiting reflex and can begin to suffer liver damage in relatively short time when the gut is empty, although rabbit gut passage time is relatively long (12 hours). So, it is not advisable to fast the rabbit before surgery.

3. Catching and restraint of animal

(1) Dog capture is more difficult and chemical immobilization with ketamine/acepromazine is normally used. The drug is injected by hand with a syringe into the rear leg muscles after the dog was confined with the help of a squeeze cage, or restrained by a special catch loop. An intractable dog may need to be muzzled. A muzzle must be fitted snugly so that it protects against bites, but at the same time it must be comfortable for the dog. A commercial muzzle may be purchased in many sizes, or a gauze muzzle may be used as described below (Fig. 0-4).

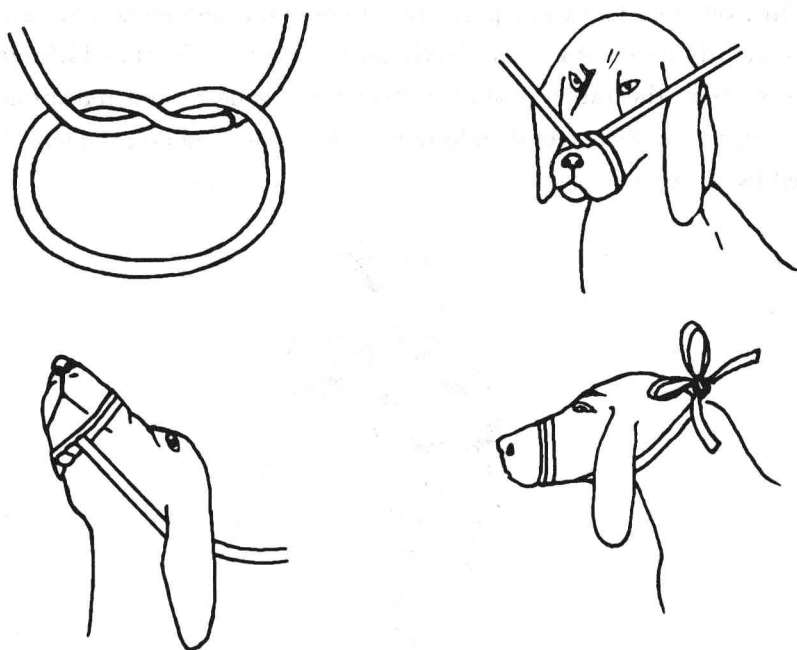


Fig. 0-4 The way to make a temporary muzzle

图 0-4 狗鼻口的捆绑方法

First, take a cotton tape approximately 100 cm in length and 1~1.5 cm in width and make a large loop with a loose knot in a single throw. A large loop allows you to keep your hands at a safe distance until the muzzle is tied. Slowly and gently, slip it over the dog's jaws. Secure the knot on top of his nose, and then tie another loop with a single-throw knot below the mouth. Finally, tie it behind the head, with a bow. **Although all knots must be secured, the muzzle should not be so tight anywhere as to pinch the skin.** This would be painful and would cause the dog to struggle.

To remove the muzzle, untie it at the back, and again keeping your hands away from the dog, slowly pull the gauze strip towards you. Note how the steady, gentle pull loosened the knots around his jaws without hurting him. That is why only single-throw knots should be used.

A muzzle should be removed immediately if a dog has difficulty breathing or starts to vomit.

(2) Rabbits need to be handled very carefully, as they have an exceptionally delicate