主编 ◆ 关文祥 钱云良

英汉对照基础整形外科学（第二版）

Bilingual Essential Plastic Surgery (2nd edition)

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关文祥　钱云良　主　编
曹谊林　李青峰　副主编
刘　伟　张如鸿　编　委
王丹茹
张涤生　邱武才　审　定
Matha Kelly[美]　录　音

上海交通大学出版社

内 容 提 要

本书对整形外科学方面进行了介绍，包括整形外科历史简介，整形外科的治疗范围和基本操作，组织移植，皮肤和皮肤组织病损，头、面和颈部整形外科，手外伤，烧伤瘢痕挛缩的外科治疗，皮肤和生殖器的整形手术，显微再造外科，美容外科，肢体淋巴水肿，皮肤摩擦术，吸脂术——体型塑造，组织扩张，组织工程学的基本原则和应用。本书采用英汉对照形式，书末附有各章英汉对照词汇，并请美国医师朗读全书，可供在校学生、研究生、进修医师用作教科书使用，也可供在职青年整外科医师阅读参考。

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再版前言

本书的第一版于1992年出版，距今已有20年。在这20年中，我国的整形外科有了很大的发展。首先，一个医院要成为三甲医院，必须有整形外科的设置。学习和想改行从事整形外科工作的医师也越来越多。1992年出第一版时，我国从事整形外科工作的只有300多人，能开展整形外科工作的医院也寥寥无几，且只分布在一些大城市。但现在有些条件好的二级医院，也能开展整形外科工作。仅在上海，就有上海交通大学医学院附属第九人民医院整形外科、第二军医大学附属长海和长征医院的整形外科、上海交通大学医学院附属仁济医院整形外科，另外一些医院也正在开展整形外科工作。上述4家医院还能培养整形外科的硕士研究生、博士研究生和大批由其他省市来的进修医师，甚至其他国家的进修医师。上海交通大学医学院附属第九人民医院的临床医学院还设置整形外科教研室，也是目前我国唯一的整形外科教研室，开展整形外科课程，授予学生整形外科的初步知识。本书不仅为在校学生而写，其目的更是针对全国的研究生和进修医师，让他们既学到整形外科的基础知识，又提高他们的整形外科专业英语水平，包括听力和发音水平，为进行国际交流打好基础。

整形外科中的小分支美容外科，更是大家趋之若鹜，私人诊所和私人医院也开办起来。但在这些人中，不免有良莠不齐，有些人根本没有经过正规训练，便私自开展美容外科，故医疗纠纷频发也在所难免，这就要求上级部门重视。

无论如何，在这20年中，整形外科的技术是在不断发展，新领域和新技术也不断出现。其中有在20年前刚起步的技术，现在也已很成熟。譬如显微外科，已发展到其他外科领域。颅面外科也从单纯的眶距过宽症的手术，发展到更多更复杂的颅面畸形手术。当时罕有的吸脂手术已普遍开展，组织扩张术也应用到身体许多部位。组织工程正在不停步发展。本书为了跟进时代步伐，有重版的必要，所以在初版的基础上，增加了5章，即肢体淋巴水肿、皮肤摩擦术、吸脂术、组织扩张术和组织工程。

本书仍采取英汉对照形式，而且还特请美国录音专业人员朗读英文部分制成MP3以提高我国整形外科医师的专业英语听力水平。由于内容的扩充，基本上囊括90%以上的专业英语词汇。只要各同行熟读本书和常听录音，就不难阅读英文文献，在参加国际学术交流时，无需借助翻译，更能直接听懂外国专家的经验介绍，甚至上台用英语作学术交流。大家的专业英语水平从此可更上一个台阶。

本书得到上海交通大学医学院和附属第九人民医院领导的大力支持；得到张涤生院士、新加坡邱武才客座教授的精心审阅，修饰文字；还得到整形外科主任李青峰和党总支书记王丽萍及办公室人员的支持；还得到九院开发公司陈锦安总经理的资助；我的中学同学李鸿芳医师在

美国替我制作录音;上海交通大学出版社精心排印,所以能顺利完成,特此致以重谢。

最后,我很感激我的亡妻李蕴玉,正是由于她无怨无悔挑起不寻常的家庭重担,使我有精力和时间编写这本书,我深深怀念她并以这本小书纪念她。

上海交通大学医学院附属第九人民医院整形外科

关文样

2012 年 6 月

Contents

Chapter 1 Brief Introduction and History of Plastic Surgery

What is plastic surgery? It is a specialized branch of surgery. The plastic surgery techniques are most often applied to the skin and soft tissues, and less often to the underlying musculoskeletal framework. Because of the special nature of plastic surgery, it is largely concerned with form, as is implied in the term "plastic".

von Graefe was the first to employ the term "plastic" in his monograph entitled *Rhinoplastick* published in Berlin in 1818. In most countries now, the term "plastic surgery" designates the specialty.

Functional aspects of plastic surgery are also important, for example, reestablishing the continuity of the mandible to permit mastication, restoring the function of the hand etc. Now, a new nomenclature has been given to this specialty as "plastic and reconstructive surgery".

Until the end of the nineteenth century, plastic surgery was essentially reconstructive. With the perfection of techniques, the correction of minor defects that were congenital in nature or secondary to aging came to be practiced. This corrective or esthetic surgery in contradistinction to reconstructive surgery becomes the new challenge to the plastic surgeon. Actually, no clear distinction can be drawn between the two types, because there is an esthetic aspect in reconstructive surgery and often a reconstructive aspect in esthetic surgery.

The plastic surgery being established as a branch of surgery began less than 70 years ago, but the practice of plastic surgery techniques can be traced back to long ago in ancient time. For example, in India, Sushruta, the Hippocrates of the sixth or seventh century before Christ, described operations for the reconstruction of the nose (now known as the Indian method). Amputation of the nose was a common practice to punish criminals and the inhabitants of conquered cities. Celsus (625 to 690 A. D) may be considered one of the originators of plastic surgery as we know it today. He described procedures varying from the treatment of nasal and jaw fractures to operation for hypospadias. During the first half of the fifteenth century, plastic surgery came to be practiced in Sicily by members of the Branca family. Antonio Branca, the son, abandoned the ancient Indian method and was probably the first to use a flap from the arm to repair mutilated lips and ears. During the sixteenth century, in the region of Calabria in the southwestern part of the Italian peninsula, a number of other practitioners appeared to have repaired mutilated noses. Among these, the work of

Gaspare Tagliacozzi of Bologna, who laid the cornerstone of modern plastic surgery, particularly in nose reconstruction, was renowned throughout Europe. His treatise *De Curtorum Chirurgia per Insitionem* was published in 1597. In describing the technique of preparing the arm flap transplantation to reconstruct the nose, he specified the delayed flap which is so important and still in use today. His technique is now known as the Italian method of nasal reconstruction.

Then came the decline of plastic surgery in the seventeenth and eighteenth centuries. The greatest hindrance to the acceptance and use of plastic surgical operations came from a misconception that reparative tissue could be taken from a slave or person other than the patient.

During the first half of the nineteenth century Labat (1834) and Blandin (1836) wrote the first treatise on plastic surgery in France. The names of two great surgeons of the nineteenth century should not be omitted: Dupuytren, particularly for his operations for Dupuytren's contracture and his classification of burns according to their depth, and von Langenbeck, who succeeded Dieffenbach, for his contribution to cleft palate and jaw surgery. During the remainder of the nineteenth century, hundreds of papers appeared on the subject of plastic surgery, e. g. Zeis's *Handbuch der plastischen Chirurgie*, published in 1838; Jobert's *Traite de Chirurgie Plastique*, published in 1849.

In 1869 Reverdin, before the Imperial Society of Surgery of Paris, reported the hastening of the healing of granulating wounds by what he called "epidermic" grafts. The technique of skin grafting was further developed when Ollier in 1872 described the clinical application of dermoepidermic graft 4 by 8 cm in size. Thiersch (1874) advocated the use of larger sheets of dermoepidermic grafts to cover wounds, now designated as "Ollier-Thiersch" grafts. Lawson (1870), Lefort (1872), and Wolfe (1876) described the use of a full-thickness graft for the treatment of eyelid ectropion.

The first American textbook *Plastic Surgery—Its Principles and Practice* by Staige Davis, was published in 1919. World War Ⅰ appears to have been the crucial starting point for the development of the concept of plastic surgery which we know today. One can consider, therefore, that World War Ⅰ was the beginning of the era during which plastic surgery became a surgical speciality. After the war, national and international congresses began to include in their scientific programs papers concerned with the methods of treatment of the victims of the war and demonstrating new surgical possibilities. Then one may consider that World War Ⅱ marks the beginning of the period of healthy adolescence; the period of 25 years extending from 1914 to 1939 then represents the period of growth.

In the 1920's and 1930's three personalities—John Staige Davis, Vilary Papin Blair, and Harold Delf Gillies-helped to shape the present concepts of plastic surgery as it is practiced in the English-speaking world. A significant surgical contribution by Staige Davis

was "the small deep skin graft" often referred to, particularly in foreign countries, as the Davis graft. Many of Davis papers remain classics even today. Among these are his papers concerning the theory and practical applications of the Z-plasty (1931), which he referred to as the "Z-incision".

Blair and Gillies had a profound influence on the development of plastic surgery, not only in English-speaking countries but also throughout the world at large. Gillies developed the tube flap, coincidentally with Filatov (a Russian in 1917), and showed many applications of the new technique in his book *Plastic Surgery of the Face* (1920). Blair defined the process of delay in nontubulated flaps in his paper. *The Delayed Transfer of Long Pedicled Flaps in Plastic Surgery* was published in 1921.

The development of the technique of split-thickness skin grafting and the paper on the subject by Blair and his pupil Barrett Brown (1929) constitute a landmark in the history of skin grafting. To facilitate removal of the split-thickness skin graft, Blair developed a special grafting knife and the Blair suction box, which, connected with a negative pressure apparatus, facilitated traction of the skin and flattening of the donor area during the cutting of the graft.

Skin grafting was greatly facilitated by the development of the dermatome by Earl C. Padgett and George F. Hood, the latter a mechanical engineer. Padgett described the three-quarter thickness skin graft, with qualities comparable to those of a full-thickness graft in 1933.

Since World War Ⅱ the scope of plastic surgery has changed. During this conflict it was necessary to treat a great many complicated fractures, to replace lost structures, to treat paraplegic pressure sores, frostbite, and burns etc. Impetus was given to the development of surgery of the hand and the treatment of burns, as well as research in tissue transplantation. Special centers, like burns center, jaw center, hand surgery center were established in strategic locations in Britain, Western Allies and the United States. As its scope increased over the years, the training of plastic surgeons had to be extended. The additional training entails extensive experiences in the basic disciplines primarily those of general surgery.

Ten years after the end of World War Ⅱ, in 1955, the International Association of Plastic Surgeons was organized under the aegis of Tord Skoog and held its first International Congress in Stockholm.

Plastic surgery today offers a wide field for research in transplantation, implantation, genetics, growth and development, speech pathology and the newer fields of microsurgery and craniofacial surgery ploneered by plastic surgeons.

Plastic surgery in China took a somewhat similar course of development to that of the world (or the West). It is one of the youngest branches of surgery starting only from late 1940s. But, as with plastic surgery abroad, the practice of plastic surgery techniques can

also be traced back to ancient China. Cleft lip repair could be traced well back to Jin Dynasty, (晋朝) A. D. 265-419, and was quite a common practice in Tang Dynasty (618-907) (唐朝). According to a book named *The Chronicle of Tang Poems* (唐诗纪事), one doctor had repaired more than ten cases of cleft lip and among these patients was a poet named Fang Gan Zeng (方干曾) who had passed the qualifying examination for officers but was not enrolled because he had a hare lip deformity. Fang therefore led a miserable life until old age when he had a chance to meet a doctor who finally repaired his hare lip.

Other stories of plastic surgery were also chronicled, e. g. *Collection of Bizarrerie* (集异记) documented removal of nasal tumor with acupuncture for cosmetic reason, and *Comprehensive Chronicle of Peace Age* (太平广记) recorded elimination of ear tumor with moxibustion (艾绒灸治).

Modern history of plastic surgery in China began in early 1940s (in the later part of China's Anti-Japanese War) when a young Chinese surgeon was sent by the then Chinese government for training in plastic surgery under guidance of Robert Ivy in the United States. In 1947, an American plastic surgeon, Dr. Webster, came to Shanghai and ran a short-term training course of plastic surgery and twelve young Chinese doctors attended it. Around middle of 1940s, a few young Chinese doctors also went to study plastic surgery in the United States. Most of them came back just before the founding of New China and practiced plastic surgery in their resident cities.

However, plastic surgery in China took shape of surgical branch only after the founding of the People's Republic of China, especially after the eruption of Korean War (1950) when many wounded soldiers from both sides urgently called for plastic surgeons' service. The following years saw the establishment of a few small plastic surgery departments in some comparatively well-equipped hospitals in Beijing【 The plastic surgery department in the Third People's Hospital of the then Beijing Medical College, headed by Professor H. Y. Zhu (朱洪荫)】, Shanghai【 The plastic surgery department in the then Guang Ci Hospital of Shanghai Second Medical College, headed by Professor T. S. Chang (张涤生)】, Xi'an【 The plastic surgery department in the Fourth Military Medical University, headed by Professor L. N. Wang (汪良能)】, etc. In 1957, the Beijing Plastic Surgery Hospital【 headed by Professor R. Y. Song (宋儒耀)】, the first of its kind in China, was established in the capital of China. Of course, at that time plastic patients were not numerous as they are now and each year only a limited number of new plastic surgeons were produced in the above mentioned hospitals and departments.

Well, with the accelerated modernization of industry and transportation, more of much complicated traumatic cases were seen. Especially with the rapidly improved living standards of Chinese people, the demands for plastic surgery became greater and greater and the shortage of plastic surgeons reaches a state so serious that the problem prompted the

Ministry of Health of China to appoint in 1973 two major national training centers for plastic surgeons in Beijing (Beijing Plastic Surgery Hospital) and Shanghai (The Plastic Surgery Department of Ninth People's Hospital). With these two major centers, as well as many more other small departments as bases, more and more plastic surgeons have been trained each year and their number now has amounted to several hundreds. They are distributed in all (except Tibet) provinces over the country and are taking care of the local plastic patients. In 1985, the Chinese Association of Plastic Surgery was established in Beijing with about 300 members (the number had increased to over 500 in late 1980s). However in recent years, as the living standard of Chinese people has been remarkedly raised, the number of plastic surgeons, by estimation, has increased to approach ten thousands throughout the whole country, including those in private practice. Many more surgeons of other specialty are turning their interest to plastic surgery especially asthetic surgery because people in large cities are increasingly demanding for asthetic surgery service.

Chapter 2 The Scope and Basic Techniques of Plastic Surgery

The Scope of Plastic Surgery

The scope of plastic surgery has been expanded in recent years and can be summarized as follows:

1. Congenital Deformities

There are many congenital deformities in the human body. Only some of them need correction or can be corrected by plastic surgery. For example, cleft lip and palate, craniomaxillofacial anomalies (hyperteriolism, Crouzon syndrome etc.), lop ear, wryneck, bifid nose; congenital hand deformities (polydactily, syndactily, club hand etc.), congenital genitalia deformities (hypospadias, absence of vagina, harmaphrodism etc.) and congenital deformities of lower extremities, etc.

2. Acquired Deformities or Defects

Most of them are caused by industrial injury (avulsion, crush), traffic accidents, thermal or chemical burn, cold injury (frostbite), electric or radiation injury, etc.

3. Deformities or Defects Resulting from Excision of Tumors

Tumors themselves may seriously destroy tissues and cause severe deformities. Excision of them causes an even larger deformity. Clinically, tumors are of two types, i. e. malignant tumors such as squamous cell carcinoma, basal cell carcinoma, fibrosarcoma, etc. and benign tumors such as hemangioma, lymphangioma, gigantic nevus, neurofibroma, tec.

4. Deformities or Defects Resulting from Severe Infection

Infection can be caused by bacteria or parasites. Those caused by bacteria are noma (extensive tissue loss of lips, gums and nose, sometimes even loss of eyes), leprosy, syphilis, etc. Extensive tissue loss may also occur in severe septicemia (especially in severe burn). Infection by filaria (parasite) may result in elephantiasis of the extremities or the genitalia which requires surgical or nonsurgical treatment such as heating and bandaging method used for lymphedema of the lower leg in Shanghai Ninth People 's Hospital.

5. Deformities or Defects from Other or Unknown Causes

Facial hemiatrophy, facial nerve palsy, pressure sore, venous stasis ulcer of the lower leg, diabetic ulcer of the sole, etc.

6. Cosmetic (esthetic) Surgery

Its aim is to correct minor deformities or to make a person look more attractive or

younger than his or her real age.

Basic Techniques of Plastic Surgery

1. Wound Healing

A wound in its broadest sense can be defined as a disruption of normal anatomical relationships as a result of some type of injury, accidental trauma or surgical incision. The healing process is a series of chemical and physical reactions that are triggered by the occurrence of the wound itself.

Regardless of the type of wound healing, the stages or phases are the same except that the time required for each stage depends on the type of healing. These stages are substrate or inflammatory, proliferative or collagen and remodeling or the maturation stage.

The healing of any wound results in a scar. The more extensive the damage, the greater the scar formation, and a more conspicuous deformity will result.

Wounds heal by contraction and by epithelialization. Wound contraction is the process by which the edges of a wound are drawn toward each other by myofibroblasts in the base of the wound. Epithelialization is the process by which the wound is resurfaced with epithelium that moves in from the edges of the healing wound.

Both processes may result in a smaller wound than initially.

Wound contracture is a pathologic process that can result from wound contraction. The degree of contracture depends on the location, size, and shape of the wound. How to minimize this inevitable contracture needs a plastic surgeon's dexterity.

2. Placing the Skin Incision

A Skin incision made in plastic surgery should not only give an adequate exposure of the part to be operated, but also should leave a scar that is acceptable to the patient after the

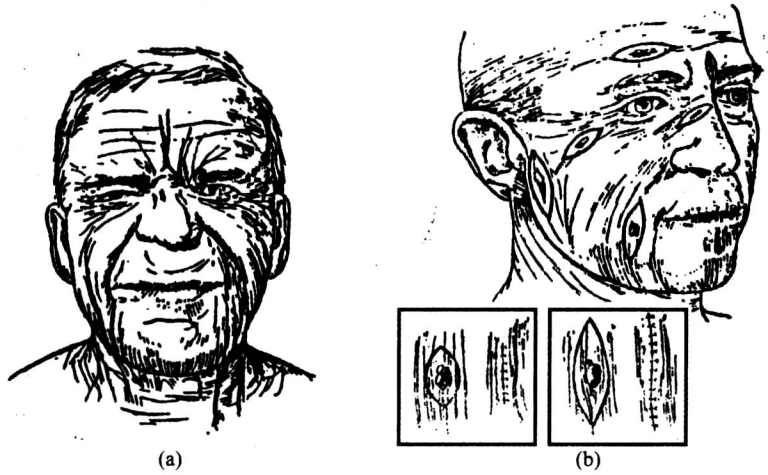

Fig. 1

wound has healed. Besides, the scar should also not interfere with the function of the operated part. Therefore, placement of the incision deserves special attention.

Generally, the incision should be placed in a skin crease or at least parallel to it, or in a natural junction to distract the eye, or inside the hair line or in the eyebrow, or in a direction that does not interfere with the motion of a joint (usually avoids crossing it in a straight line on the flexion or extension aspect). In the face, the incision should be placed along the Langer 's lines (Fig. 1) .

The skin incision should be made with a sharp knife. A blunt knife will cause more damage to the wound, resulting in more scar formation. The wound edges should be handled gently with fine instruments. Hemostasis should be thorough, and clamp and tie the bleeding points with as little surrounding tissue as possible. Avoid prolonged exposure of the wound to dry air which is harmful to tissue cells.

3. Suturing the Wound

The needle should enter the epidermis at a right angle to the skin surface and 2 to 3 mm from the wound edge. The needle should travel down through the epidermis, dermis, and a bit of subcutaneous tissue at a right angle to the wound surface. It then exits from the opposite side in the same depth and fashion. The suture is then tied using an instrument rather than fingers. The tension is adjusted so that the epithelial edges are not pinched together but simply lie together, touching each other.

The simple loop suture is the one most commonly used in plastic surgery. It brings the epithelial edges together. Some eversion of the edges (Fig. 2) is preferable to inversion of the edges. Therefore, it is important to take an adequate bite of the subcutaneous tissues so as to push up and slightly evert the epithelial edges. It is sometimes difficult to evert the wound edges. When it is so, a vertical mattress suture may help (Fig. 3). The knot is tied on the side on which suture was begun.

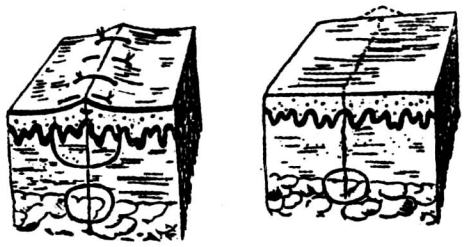

Fig. 2

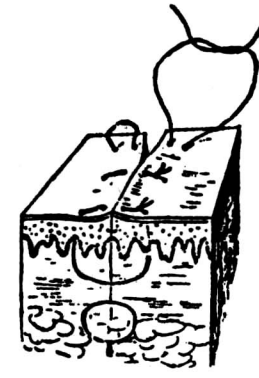

Fig. 3

The choice of suture material is a matter of personal preference. The nonabsorbable sutures, such as monofilament nylon and silk, are less reactive to the tissue than are absorbable sutures, such as catgut and the newer synthetic sutures. A fine, strong

acceptable suture for use as an interrupted simple loop suture on the face is 6-0 monofilament nylon or silk on an atraumatic cutting needle. A heavier suture (4-0) may be used in areas of the body where the tissues are thicker and under more tension (back, arms, legs).

4. Postoperative Care

The wound edges should be kept clean postoperatively, and the sutures should be removed as early as possible. The eyelids heal earliest and the sutures may be removed 48 to 72 hours postoperatively because if removed later than one week, stitch marks will be left permanently on the skin. In contrast, sutures in the leg must be left for about 14 days because at that time tensile strength of the wound can then be adequate.

The sutures should be removed in such a way that the wound edges are pulled together. Since the wound is not strong at this time, it is easy to pull the edges apart. Wounds usually gain their full tensile strength after several weeks.

Z-plasty

Z-plasty (Fig. 4) is a geometric design involving the interchange of two interdigitating triangular flaps. Each line is drawn like a Z, and each line is equal in length to one another. The angles of the Z runs along the line of contracture or of the existing scar whose direction is to be changed.

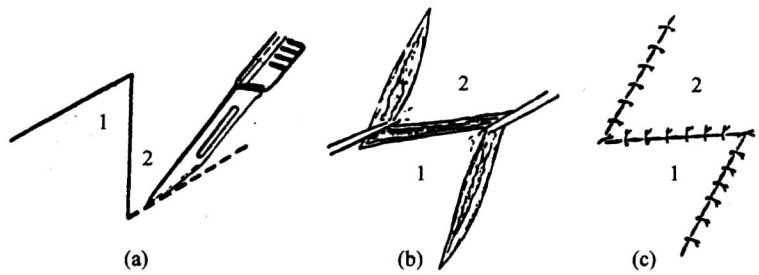

Fig. 4

The classic Z-plasty has 60-degree angles that form equilateral triangles on both sides of the central limb. Those triangles are mobilized and elevated. The two flaps are then exchanged in position and sutured in place. With the 60-degree angles, there is a 70% theoretical gain in length of the skin contracture or scar.

The following table shows the relationship between angles and the theoretical gain in length.

Angles of Z-plasty (°)	Theoretical Gain in Length (%)
30～30	25
45～45	50
60～60	75

75～75	100
90～90	120

In actual practice, it is seldom to design an angle less than 30 degrees or greater than 90 degrees, because in the former case, the length gained is so small that is without any merits, while in the latter case, it is difficult or even impossible to interchange the two triangular flaps.

If a greater length gain is desired, one can design a Z-plasty with longer central limb, because with angles constant, the greater the length of the central limb, the greater will be the actual gain in length accomplished by the Z-plasty (Fig. 5).

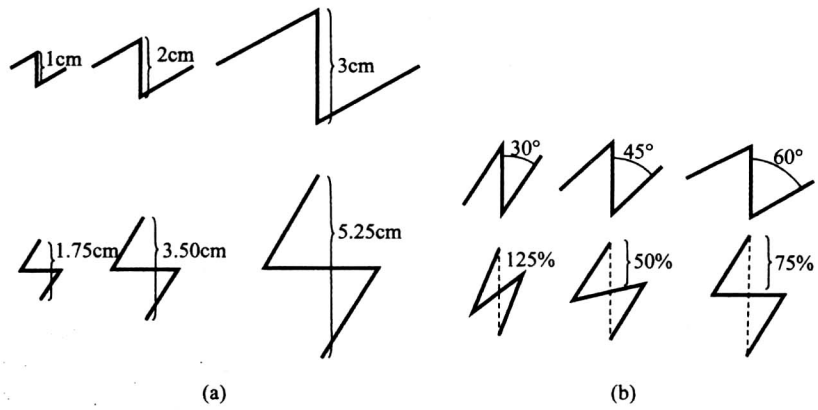

Fig. 5

It should be emphasized that the theoretical gain in length is based on geometrical studies with paper models. In contrast, biomechanical properties of the skin causing its tension to vary from loose, elastic to taut, may not allow surgery to follow such an exact science as mathematics. Gibson and Kennedi have measured the theoretical and actual gain in length in four Z-plasties in human beings. The actual gain in length was either less (14 and 16 per cent less) or more (7 and 27 per cent more) than calculated.

In order to transpose the flaps of a Z-plasty, the skin at the base of these flaps must be loose or elastic enough to be pulled over into its new position. When the skin is contracted in a direction perpendicular to the central limb of the planned Z, then it may be impossible to do a Z-plasty. This occurs particularly following the skin grafting of a burned extremity, when the skin is often very tight.

The Z-plasty is a useful and commonly used technique in plastic surgery. To summarize, it has three major uses:

(1) To increase the length of the skin in a desired direction, such as in scars that cross the flexion crease of the axilla, elbow, fingers, knee or neck; or in scars or congenital skin webs that cross a concave surface; or in U-shaped scars that are often elevated in the center