

6. *Paring and Approximation with Needles and/or Sutures*

IT is not known for certain who was the first to operate on a cleft of the lip. There have been inferences that Aurelius Cornelius Celsus, a Roman physician of the first century A.D., was the first, but no real proof has ever been cited.

CLEFT LIP SURGERY IN THE CHIN DYNASTY

Translation by Khoo Boo-Chai, of Singapore, of the Chin annals compiled in the early part of the Tang Dynasty reveals what must be the first cleft lip surgery described in world literature. It seems that Wei Yang-Chi, a Chinese farmer's son, was born with a harelip (T'u Ch'ueh) deformity. Boo-Chai commissioned artist Steve Lu to illustrate young Wei in typical fourth-century Chin Dynasty plain peasant dress.

In about A.D. 390 of the Chin Dynasty an unusually astute fortune-teller studied Wei's palm and predicted wealth and honor for the boy. At age 18 Wei took what rice he could carry and set out to see Governor Yin Chung-K'an. The governor was impressed with this lad and called in one of his physicians who specialized in lip clefts. The cleft surgeon took one look at Wei and explained:

I can cure your condition by *cutting* and *stitching* the edges together. However, after the operation it will be necessary for you to rest the affected



An ideal
plastic patient!



part for 100 days. During this time you can ingest only thin gruel and you cannot smile or talk.

Wei replied:

What is 100 days to me when for relief of my condition I would remain silent for half a lifetime.

The operation was done, and Wei kept his word by keeping his mouth shut for 100 days. After this, as could be predicted, he prospered, eventually becoming the governor general of six provinces and being honored by his emperor with an ancient order. Wei is shown here many years after the operation and clothed by Lu in an official ornate governor's gown.

Sometime during the Tang Dynasty (A.D. 618 to 907) Fang Kan gained considerable fame as "the doctor of lips."



Blair Rogers

FROM THE LEECHES THROUGH THE MIDDLE AGES

We are all indebted to our walking plastic surgery library, Blair O. Rogers of New York University Medical Center, for his intellectual curiosity and ability to extract important historical data from the world literature. Along with *Plastic and Reconstructive Surgery* Editor Frank McDowell, Associate Editor Robert Goldwyn and others, he has made it possible to piece together the early history of clefts.

THE LEECHES CLOSED LIP CLEFTS

The Saxon surgeons of pre-Norman Britain, known as "leeches," are the next group of specialists to describe surgery of the cleft lip in Europe. The principle of early cleft lip surgery from the time of the leeches through the Middle Ages and, in fact, well into the eighteenth century was directed toward simple freshening of the edges of the cleft and approximation of these edges until firm union occurred. In the *Leech-Book of Bald*, about A.D. 950, the operation is described simply:

For hairlip, pound mastic very small, add the white of an egg and mingle as thou dost vermilion, cut with a knife *the false edges of the lip*, sew fast with silk, then smear without and within with the salve, ere the silk rot. If it draw together, arrange it with the hand; anoint again soon.

THE METHOD OF CAUTERY

In the original Sanskrit text of the Susruta Samhita, methods of cauterization of wounds were described. Based on this the Hindu surgeons of the sixth or seventh century B.C. used burning devices and handed their techniques down through the centuries. About A.D. 1000, Albucasis, the greatest surgeon of the Arabian school, used cauterization of wound edges. It is not known for certain that he applied this method in cleft lip, but it is likely that he and other Arabian surgeons as well as those influenced by this school employed the cautery approach in preference to the knife because of the reduced bleeding. Turkish surgeons five centuries later still preferred cautery as have surgeons of many other nations.

FLEMISH FIGURE-OF-EIGHT

In the early part of the fourteenth century, the Flemish surgeon Jehan Yperman first described in detail the repair of both unilateral and bilateral clefts of the lip. As noted by Rogers in 1964, Yperman actually sutured the edges of the freshened borders of the cleft lip by using a triangular needle threaded with a twisted wax suture and reinforced this closure with a long needle passed through the lip some distance from the edges of the cleft in order to make a more accurate approximation. This latter needle was held in place with a wraparound figure-of-eight thread. Yperman mentioned that some surgeons of his era used relaxing incisions externally in the cheeks to close very wide clefts, but he himself refrained from this procedure because of the facial disfigurement which might "compromise the reputation of the surgeon."

During the fourteenth century it was probably the barber-

*Spoken like
a true plastic
surgeon.*

surgeons of England who passed on the skills required to repair clefts of the lip.

INTERRUPTED SUTURES

Heinrich von Pfolssprundt, a Bavarian army surgeon, in his 1460 book, *Buch der Bundth-Ertznei*, described cleft lip closure using a razor or scissors to freshen the edges and the placement of sutures through the entire thickness of the lip. Over this he applied a plaster containing a red healing salve which was changed twice a day until the wound was healed in three weeks.

About 1530 Hieronymus Brunschwig, an Alsatian army surgeon from Strasbourg, strapped his cleft lip patients to a table with towels, freshened the cleft edges with scissors and achieved union by interrupted waxed silk sutures reinforced with a pinching clasp dressing or a self-retaining clasp. The wound was anointed with a thick paste made of powder of eggshell chalk and egg, and a cloth was wrapped over the entire wound, face and neck, the bandage being looped under the arms in a Roger of Salerno twelfth-century dressing.

FRANCO AND PARÉ

In the sixteenth century two gifted Frenchmen made contributions to this surgery. Pierre Franco in 1556 described the operation in detail, and Ambroise Paré in 1568 first illustrated the procedure. These two Huguenots are inevitably coupled. Franco was the senior but a student of Paré. Paré was the more influential, serving as surgeon to four kings, while Franco worked in the provinces or in exile. It is true that even today Franco's name is mentioned only by the specialists; Paré is known by everyone. After much research, Barsky suggests that Franco developed the early surgery of cleft lip of his day whereas history has recorded it mostly as the work of Paré. Yet the contributions of each had much influence on surgeons in the centuries to follow, and undoubtedly Paré's writings and illustrations had the most far-reaching effect.

Franco wrote in 1556:

The entire skin margins of the cleft which are to be joined must be cut with razor or scissors, or [seared] with the cautery. Then put on dressings to ease the pain and leave them for one or two days . . . if cautery is used . . . the eschar [is removed]. . . . After this is accomplished, the margins must be brought together so that . . . no portion of one . . . does not touch the other. This can be done in two ways, one with needles . . . and the other with pieces of cloth triangular in shape . . . made adherent with a special ointment including egg albumin to the cheeks on each side of the cloven lip. By suturing the points of the cloth together the edges of the cleft are brought into apposition.

This was before the advent of anesthesia, and Franco partly explains that the adhesion method is preferable because of:

causing the least pain and the least scarring.

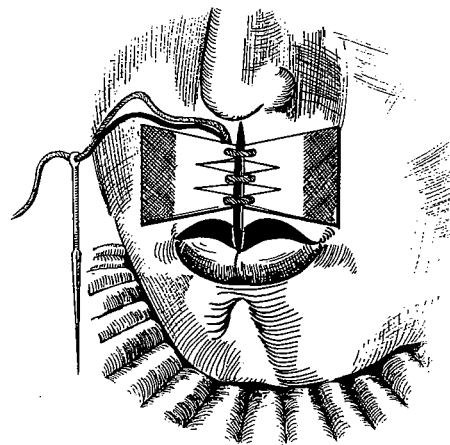
He also had the ingenuity to free the lip elements from their attachments to the upper jaw to ease the closure in wide clefts. This principle was enhanced by Dieffenbach in 1830 with wide undermining and lateral cuts under the nostrils well out into the cheeks and in modified forms is still used in many clinics today.

Ambroise Paré, son of a cabinetmaker, at age 16 learned the rudiments of surgery from Jean Vialot, the barber of Laval. He then became a surgical resident for three years at Hôtel-Dieu and during this time contracted bubonic plague. Paré not only survived with a few scars but lived to be 80. His next surgical experience came while he was in the army. Lack of formal education enabled Paré to bypass superstitions of his dark age and find truth by observation and experience. He said, "Surgery is an art," and set five proper duties of a surgeon which are actually the *first published plastic surgical principles!*

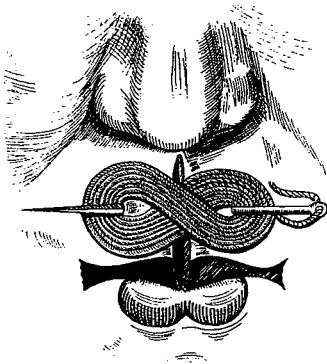
- To take away what is superfluous.
- To restore to their places things which are displaced.
- To separate those things which are joined together.
- To join those which are separated.
- To supply the defects of nature.



Pierre Franco



Ambroise Paré



Paré pared the edges of lip clefts but preferred closing the cleft by transfixing the lip elements with a needle and fastening it with a figure-of-eight wraparound thread. He wrote:

Wherefore you must use a three or four square needle . . . being thred with a waxed thred; and with this you must thrust through the lips . . . and leave the needle sticking in the wound, then wrap the thred to and again over the ends thereof eight or ten times, just after the manner which women use to fasten a needle with thred in it, upon their sleeves, or Tailors to their hats or caps, that they may not lose them. The needle thus fastened shall be there untill the perfect agglutination of the wound; this kind of suture is used in . . . harelips, for so we commonly call lips which are cleft from the first conformation in the wombe by the error of the forming faculty.

A ROYAL COMPENSATION

According to the research of Nagdy Saad and John Barron of Salisbury, England, both Paré and his *Oeuvres*, published in 1575 and containing much of the information on Paré, were saved by a king. During the terrible 1572 massacre of St. Bartholomew's Night instigated by Catherine de'Medici, Paré narrowly escaped death. King Charles IX, exclaiming over the shame of the loss of the life of one who had saved so many lives, hid the Huguenot in his royal chambers until all other heads had rolled.

TAGLIACOZZI

Gaspar Tagliacozzi of Bologna qualified in medicine in 1570 and probably studied under Paré as he often referred to Paré in his writings. By 1597 Tagliacozzi was excoriating the cleft edges and stitching them together with interrupted sutures. He wrote:

Let the Artist therefore take up that part of the Lip, which must be excoriated, in his Left Hand, and then take off the Skin equally with a very sharp Knife, till the Blood comes, to the very Angle of the Hiatus. . . . This Operation may also be performed very quickly and safely with a pair of Scissors. The same must be done on the other side. Then we must draw the parts together with the Hand, and stitch them. We must observe this, not to take our stitches superficially, but through all. The Artist must



Gaspar Tagliacozzi

therefore pass his Needle straight through the Lip from outside inwards, and on the other side he must pass the Needle from the inside outwards. He must tie the threads . . . and then cut them off. . . .

RETENTION BANDAGE

Hieronymus Fabricius of Padua, a pupil of Fallopius and teacher of Harvey, about 1600 advised use of buccal mucosa and tissue from the alveolus in closing clefts of the lip. If the cleft was wide, Fabricius used an agglutinative bandage to bring the edges of the cleft together before he began freshening the margins and inserting needles, the ends of which he bent over after having passed them.

GERMAN TEXTBOOK

In the most popular surgical work of the eighteenth century, the German surgeon Lorenz Heister in his *Chirurgie* recounted:

Many German Quacks and Mountebanks frequently retain the Lips of the Wound together by strong Thread passed through them instead of Needles, after which they tie the Ends of the Thread in the same manner as we directed for the knotted Suture in Part I, Book I, Chapter VI . . . and thus they succeed, and perform good Cures, though in an awkward manner, and by obtuse and unfit Instruments, especially when the Fissure is but small, for when it is large this method will hardly succeed.

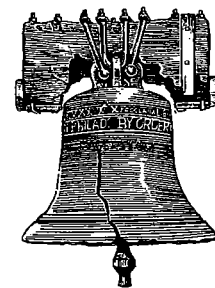
where have I
heard this
one before!

COLONIAL AMERICA

From newspaper reports, scholarly Blair Rogers has pieced together cleft lip work in colonial America.

On Friday, September 1, 1770, in the *Boston Evening Post*, there was an interesting item:

A few Weeks since the Operation for the Hare-Lip was performed to great Perfection on a young Man in Milton near Brush-Hill; and a Child in Boston has received as much Benefit from the Operation as the Case would admit of by Mr. Hall, Surgeon of the 14th Regiment.



These were exciting times in more than one way in America.



In April 1775 silversmith Paul Revere made his famous midnight ride. Just one month later, in May 1775, rivaling Revere's news, an advertisement was placed in a Philadelphia paper by "Dr." Anthony Yeldall with testimony from one of his patients' parents:

For the benefit of others, be it made public, that I John Dunbar, of the City of Philadelphia, had a daughter with the deformity of a Hare-Lip; I then applied to Dr. Yeldall, who, to my satisfaction, did the operation in one minute, by the watch, and compleated the cure in four days.

John Dunbar

None need despair, having the above mentioned deformity, for let them be ever so large or frightful, or have been cut ever so often before, they will be done in one minute, and the cure compleated in four days, or nothing will be required. Poor people may have them done GRATIS.

Dr. Anthony Yeldall

On March 29, 1780, in New London the Connecticut *Gazette* published the following advertisement:

Lawrence Stork, From Germany, Informs the Public, That he undertakes to cure . . . hair-lips . . . and he further informs, that if he makes no cure, he expects no pay. He may be seen at Mr. Jacob Fink's in New London.

In a more traditional style, Matthew Wilson, a minister and physician from Pennsylvania practicing in Delaware, wrote an unpublished compendium of medicine from 1765 to 1787 called the "Therapeutic Alphabet" in which cleft lip surgery is described in the quaint vernacular of that period.

Labium Leporinum: Hare lip. see Lagocheilos.

Lagocheilos: Harelip. Is a Deformity in which ye Lip is divided by Chasm or Fissures. . . . The Operation should be omitted, untill ye Child has some Reason to suffer it to be done. . . . Separate ye Lip from ye upper Jaw; divide ye Frenulum we connects it to ye Gums. If ye Dentes Incisorii too much projected, cut ym out in Infants. Cut off ye callous Lips wt Scissors ye whole length, but take Care to make ye Wound in Straight Lines. Then bring ye two Lips of ye wound exactly together, & pass a couple of pins, one pretty near ye Top & ye other as near ye bottome, thro' middle of both edges of it, & secure ym in yt Situation by twisting a Piece of Wax'd thread, across & round ye pins 7 or 8 times. . . . In 8 or 9 Days ye parts generally are found united, yn gently extract the Pins and apply dry Lint

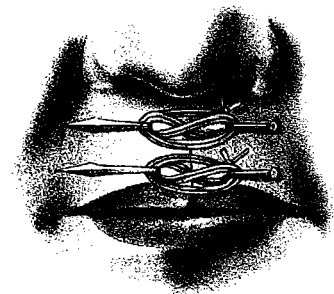
and Adhesive Plaster. . . . Silver Pins & Steel Points suit ye Pomp of ye Great, but common Pins Answer ye End fully as well.

NEEDLES AND PINS, THREADS AND STITCHES

The eighteenth-century controversy over the use of harelip pins with the figure-of-eight wraparound thread versus interrupted sutures passing through the lip edges and tied across the cleft is reminiscent of controversies that have raged and will continue to erupt as long as surgeons are individuals free to seek and promote a better way. Often the new or unorthodox method is labeled quackery. It is true that untrained surgeons, often no more than quacks and charlatans, by their "unshackled" nature may in some small item supersede the staid, trained traditionalist. Yet, in time, the best methods by their results, regardless or in spite of the promoter, eventually win out.

It seems that the wraparound technique illustrated by Paré had more appeal to colonial surgeons such as Wilson than the more sophisticated suturing described by Tagliacozzi. Yet Heister considered the figure-of-eight wraparound thread, which had been the traditional cleft lip suture for four centuries, the more scientific. He accused quacks of using the interrupted sutures. We can surmise from Heister's writing that Lawrence Stork probably used interrupted sutures rather than the figure-of-eight. Yet when we read how fast Yeldall could close a lip, we are prompted to think that, quack or not, he might have been using the figure-of-eight.

Certainly J. A. Pancoast indicated in 1844 that he was still paring the cleft edges in a straight line with a bistoury and using a pair of harelip pins with wraparound thread.



NEEDLE REMOVAL

LeClerc's 1701 advice in handling the through-and-through needles carrying the figure-of-eight thread is of interest:

Stitch
mark

The Patient must be drest three Days after; and it is requisite at the first time only to untwist half the Needle, loosening the middle Thread if there be three; to which purpose a Servant is to thrust the Cheeks somewhat foreward. On the eighth Day the middle Needle may be taken off, if it be a young infant. Nevertheless the Needles must not be remov'd till it appears that Sides are well join'd; neither must they be left too long, because the Holes would scarce be brought to close.

FROM A FIGURE-OF-EIGHT TO 3 M



Whether the early surgeons used cloth bandages with ties, needles or pins with figure-of-eight wraparound threads or interrupted sutures, they were not far behind us in this aspect. Today's sophisticated techniques of three-layered Ethicon suturing, 3 M taping, adhesive "butterflies" and Logan's bow are mere refinements of the earlier methods. Unfortunately, it is also true that this knowledge has not permeated to all corners of the world so that even today untrained surgeons in underdeveloped areas use antiquated techniques of simple paring and approximation with results no better than those obtained by Wilson, Paré or the better "leeches."