HISTORY

HISTORY

Although the evolution of plastic surgery as a surgical specialty is comparatively recent, with the ‘masters’ of the First World War years, including Sir Harold Gillies, a New Zealand otolaryngologist working in London, considered to be the founding fathers, its origins hark back to ancient times and - were driven by the need to treat burns, congenital deformity and acquired injuries (whether judicial, vindictive or sustained in battle). The ‘pre-scientific period’ included a description by the pioneering Indian surgeon Sushruta in 600 /uni00A0 /b.sc/c.sc/e.sc of numerous facial flaps (including a method to repair the split earlobe), which predated the forehead flap being used for nasal reconstruction by some 400 years. Anatomical under - - standing improved markedly from the mid-fifteenth century – the ‘scientific period’ – as human dissection became widely - practised and the development of printing allowed anatomical drawings to be reproduced and disseminated. During this . How - period the ‘Italian rhinoplasty’, which utilised a two-stage - brachial flap technique , was popularised by Tagliacozzi. The ‘modern period’ – from the nineteenth century to the present day – witnessed a detailed appreciation of the anatomy of the - cutaneous circulation, although the significance of the early research undertaken by Manchot took almost a century to be fully recognised, such that the random-pattern ‘waltzed’ tubed the musculocutaneous latissimus dorsi flap by Tansini (1896). This era of surgical discovery was greatly facilitated by the advent of antisepsis by Semmelweis (1847) and Lister (1883), the discovery of anaesthesia by Morton (1846), antibiotics by Fleming (1928) and immunosuppression by Hench (1949) and Calne (1962). The past 50 years have seen an explosion in the complex ity of microsurgical reconstructive techniques, culminating in vascularised composite tissue transplantation becoming part of routine clinical practice. A timeline of some of the key advances in the history of plastic surgical innova tion is given in Table 47.1 . Iginio Tansini , 1855–1943, Professor of Surgery , University of Pavia, Pavia, Italy . Ignaz Philipp Semmelweis , 1818–1865, Pr ofessor of Obstetrics, University of Pest, Pest, Hungary . Joseph Lister, Baron Lister of Lyme Re gis , 1827–1912, Professor of Surgery , University of Glasgow , Glasgow , UK. William Thomas Green Morton , 1819–1868, an American dentist. Sir Alexander Fleming , 1881–1955, a Scottish microbiologist who discovered penicillin at St Mary’s Hospital, London, UK, for which he was jointly awarded the Nobel Prize in 1945. Philip Showalter Hench , 1986–1965, Professor of Medicine, Mayo Clinic, Rochester, USA, was jointly awarded the Nobel Prize in 1950 for his pioneering work on cortisone. Sir Roy Y orke Calne , b. 1930, Emeritus Professor of Surgery , University of Cambridge, Cambridge, UK. Skin is the largest end organ, covering the body’s entire exter - nal surface. Together with its derivatives, including hair, nails and sweat glands, it forms the integumentary system. The skin serves a number of functions that are critical for survival. It provides a protective barrier against mechanical, thermal and irradiation (ultraviolet) injury and infection. It also plays a role - in homeostasis by preventing fluid loss and regulating tempera - ture. As the primary interface with the external environment, it acts as a sensory organ and also produces vitamin D. Hence restoration of the skin is essential even if the under lying struc - tures await delayed reconstruction.

TABLE 47.1 A selection of key advances in the history of plastic surgery innovation. Year Surgeon Nationality c . 1800 /uni00A0 Ancient Egypt BCE – India c . 600 /uni00A0 BCE Sushruta Rome c . 25 /uni00A0 CE Celsus Spain c . 1000 /uni00A0 CE Al-Zahrawi Sicily c . 1400 /uni00A0 CE Branca France 1789 Desault USA 1854 Hamilton UK 1862 Wood Germany 1889 Manchot France 1894 Dauriac Italy 1896 Tansini France 1912 Carrel Russian Empire and UK 1916–1917 Filatov and Gillies USA 1954 Murray UK 1968 Cobbett Australia 1973 Daniel and Taylor Australia 1978 Taylor China 1979 Yang Japan 1989 Koshima France 1998 Dubernard Taiwan 2004 Chen France 2005 Devauchelle Spain 2006 Barret Innovation Wound care techniques Local /f_l aps for nasal reconstruction Local /f_l aps for lip reconstruction Introduced catgut sutures and developed numerous surgical instruments Distant (arm) /f_l ap for nasal reconstruction Recognition of the importance of de /f_i nitive wound debridement Concept of /f_l ap ‘delay’ with the distant cross-leg /f_l ap Concept of axial pattern /f_l aps with the pedicled groin /f_l ap (Figure 47.1) Cutaneous arterial supply using cadaveric arterial injection studies First description of a pedicled muscle (rectus abdominis) /f_l ap Breast reconstruction using a pedicled musculocutaneous latissimus dorsi /f_l ap Nobel Prize for the development of vascular anastomosis and its application to organ transplantation Tubed pedicled /f_l aps and concept of ‘waltzing’ Nobel Prize for the /f_i rst renal transplant between identical twins Free toe-to-hand transfer Fr ee groin /f_l ap to foot Concept of the ‘angiosome’ Free radial for earm (‘Chinese’) /f_l ap Perforator /f_l aps (Figure 47.2) Hand transplant Vascularised lymph node transfer Partial face transplant Full face transplant

The skin’s structure consists of the outer epidermis (ecto dermal in origin), the dermis and the inner hypodermis (of mesodermal origin). The deepest layer of the epidermis is the stratum basale, where stem cells di ff erentiate into keratinocytes and migrate upwards towards the outermost stratum corneum an acellular layer made of dead keratinocytes acting as a barrier to fluid loss and protection against invasion by micro organisms. The epidermis regenerates from deeper follicular elements such as hair follicles and sweat glands. The dermis is connected to the epidermis via the basement membrane and consists of the upper papillary layer, composed of loose connective tissue, and a dee per reticular layer, which is thicker and consists of dense connective tissue and collagen fibres . The dermis houses the hair follicles, sweat glands, sen sory receptors and blood vessels. Geo ff rey Ian Taylor , contemporary , Professor of Plastic Surgery , University of Melbourne, Melbourne, Australia. skin appendages, including hair follicles, sensory receptors, neurones and blood vessels. The relative composition of these lay ers varies depend - ing on the functional requirements of the region concerned. Specialised areas such as hair-bearing scalp skin or glabrous heel skin can be challenging to reconstruct as there are limited donor sites. However, for non-specialised skin, the abdomen and groin make ideal donor sites as the y are elastic and thin and, thus, amenable to primary closure. Blood vessels are found in the dermis and hypodermis and are arranged in a number of plexuses between each anatomical layer (Figure 47.3). Ultimately , they all originate from a main feeding or sour ce vessel, via fine perforating vessels (‘perforators’) either directly or indirectly by traversing through fascia, muscle or bone. This observation gave rise to Taylor’s ‘angiosome’ concept, in which angiosomes refer to three- dimensional blocks of tissue including skin and deeper tissue layers that are supplied by specific source arteries. Thus, any skin or other tissue types can be detached as a ‘flap’ provided the vessel course from the source vessel to the end organ that is to be transferred is kept intact. - Cutaneous nerves tend to run axially out of the major nerve trunks but are less defined than most perforating blood vessels. It is possible to coapt nerve ends between a cutaneous nerve within a flap and one at the recipient site, so-called , ‘neurotisation’, to r egain some sensation in the flap. -

Figure 47.1 Pedicled groin /f_l ap. Full-thickness burn wounds over the dorsum of multiple digits. The exposed extensor tendons were covered by a pedicled groin /f_l ap. The pedicle was divided at 3 weeks and the digits were subsequently separated in stages. Figure 47.2 Three views of an anterolateral thigh /f_l ap on detachment from the donor site prior to anastomosis at the recipient site. Pedicle (arrow) consisting of one perforator artery and two vena comitans.

HISTORY

Although the evolution of plastic surgery as a surgical specialty is comparatively recent, with the ‘masters’ of the First World War years, including Sir Harold Gillies, a New Zealand otolaryngologist working in London, considered to be the founding fathers, its origins hark back to ancient times and - were driven by the need to treat burns, congenital deformity and acquired injuries (whether judicial, vindictive or sustained in battle). The ‘pre-scientific period’ included a description by the pioneering Indian surgeon Sushruta in 600 /uni00A0 /b.sc/c.sc/e.sc of numerous facial flaps (including a method to repair the split earlobe), which predated the forehead flap being used for nasal reconstruction by some 400 years. Anatomical under - - standing improved markedly from the mid-fifteenth century – the ‘scientific period’ – as human dissection became widely - practised and the development of printing allowed anatomical drawings to be reproduced and disseminated. During this . How - period the ‘Italian rhinoplasty’, which utilised a two-stage - brachial flap technique , was popularised by Tagliacozzi. The ‘modern period’ – from the nineteenth century to the present day – witnessed a detailed appreciation of the anatomy of the - cutaneous circulation, although the significance of the early research undertaken by Manchot took almost a century to be fully recognised, such that the random-pattern ‘waltzed’ tubed the musculocutaneous latissimus dorsi flap by Tansini (1896). This era of surgical discovery was greatly facilitated by the advent of antisepsis by Semmelweis (1847) and Lister (1883), the discovery of anaesthesia by Morton (1846), antibiotics by Fleming (1928) and immunosuppression by Hench (1949) and Calne (1962). The past 50 years have seen an explosion in the complex ity of microsurgical reconstructive techniques, culminating in vascularised composite tissue transplantation becoming part of routine clinical practice. A timeline of some of the key advances in the history of plastic surgical innova tion is given in Table 47.1 . Iginio Tansini , 1855–1943, Professor of Surgery , University of Pavia, Pavia, Italy . Ignaz Philipp Semmelweis , 1818–1865, Pr ofessor of Obstetrics, University of Pest, Pest, Hungary . Joseph Lister, Baron Lister of Lyme Re gis , 1827–1912, Professor of Surgery , University of Glasgow , Glasgow , UK. William Thomas Green Morton , 1819–1868, an American dentist. Sir Alexander Fleming , 1881–1955, a Scottish microbiologist who discovered penicillin at St Mary’s Hospital, London, UK, for which he was jointly awarded the Nobel Prize in 1945. Philip Showalter Hench , 1986–1965, Professor of Medicine, Mayo Clinic, Rochester, USA, was jointly awarded the Nobel Prize in 1950 for his pioneering work on cortisone. Sir Roy Y orke Calne , b. 1930, Emeritus Professor of Surgery , University of Cambridge, Cambridge, UK. Skin is the largest end organ, covering the body’s entire exter - nal surface. Together with its derivatives, including hair, nails and sweat glands, it forms the integumentary system. The skin serves a number of functions that are critical for survival. It provides a protective barrier against mechanical, thermal and irradiation (ultraviolet) injury and infection. It also plays a role - in homeostasis by preventing fluid loss and regulating tempera - ture. As the primary interface with the external environment, it acts as a sensory organ and also produces vitamin D. Hence restoration of the skin is essential even if the under lying struc - tures await delayed reconstruction.

TABLE 47.1 A selection of key advances in the history of plastic surgery innovation. Year Surgeon Nationality c . 1800 /uni00A0 Ancient Egypt BCE – India c . 600 /uni00A0 BCE Sushruta Rome c . 25 /uni00A0 CE Celsus Spain c . 1000 /uni00A0 CE Al-Zahrawi Sicily c . 1400 /uni00A0 CE Branca France 1789 Desault USA 1854 Hamilton UK 1862 Wood Germany 1889 Manchot France 1894 Dauriac Italy 1896 Tansini France 1912 Carrel Russian Empire and UK 1916–1917 Filatov and Gillies USA 1954 Murray UK 1968 Cobbett Australia 1973 Daniel and Taylor Australia 1978 Taylor China 1979 Yang Japan 1989 Koshima France 1998 Dubernard Taiwan 2004 Chen France 2005 Devauchelle Spain 2006 Barret Innovation Wound care techniques Local /f_l aps for nasal reconstruction Local /f_l aps for lip reconstruction Introduced catgut sutures and developed numerous surgical instruments Distant (arm) /f_l ap for nasal reconstruction Recognition of the importance of de /f_i nitive wound debridement Concept of /f_l ap ‘delay’ with the distant cross-leg /f_l ap Concept of axial pattern /f_l aps with the pedicled groin /f_l ap (Figure 47.1) Cutaneous arterial supply using cadaveric arterial injection studies First description of a pedicled muscle (rectus abdominis) /f_l ap Breast reconstruction using a pedicled musculocutaneous latissimus dorsi /f_l ap Nobel Prize for the development of vascular anastomosis and its application to organ transplantation Tubed pedicled /f_l aps and concept of ‘waltzing’ Nobel Prize for the /f_i rst renal transplant between identical twins Free toe-to-hand transfer Fr ee groin /f_l ap to foot Concept of the ‘angiosome’ Free radial for earm (‘Chinese’) /f_l ap Perforator /f_l aps (Figure 47.2) Hand transplant Vascularised lymph node transfer Partial face transplant Full face transplant

The skin’s structure consists of the outer epidermis (ecto dermal in origin), the dermis and the inner hypodermis (of mesodermal origin). The deepest layer of the epidermis is the stratum basale, where stem cells di ff erentiate into keratinocytes and migrate upwards towards the outermost stratum corneum an acellular layer made of dead keratinocytes acting as a barrier to fluid loss and protection against invasion by micro organisms. The epidermis regenerates from deeper follicular elements such as hair follicles and sweat glands. The dermis is connected to the epidermis via the basement membrane and consists of the upper papillary layer, composed of loose connective tissue, and a dee per reticular layer, which is thicker and consists of dense connective tissue and collagen fibres . The dermis houses the hair follicles, sweat glands, sen sory receptors and blood vessels. Geo ff rey Ian Taylor , contemporary , Professor of Plastic Surgery , University of Melbourne, Melbourne, Australia. skin appendages, including hair follicles, sensory receptors, neurones and blood vessels. The relative composition of these lay ers varies depend - ing on the functional requirements of the region concerned. Specialised areas such as hair-bearing scalp skin or glabrous heel skin can be challenging to reconstruct as there are limited donor sites. However, for non-specialised skin, the abdomen and groin make ideal donor sites as the y are elastic and thin and, thus, amenable to primary closure. Blood vessels are found in the dermis and hypodermis and are arranged in a number of plexuses between each anatomical layer (Figure 47.3). Ultimately , they all originate from a main feeding or sour ce vessel, via fine perforating vessels (‘perforators’) either directly or indirectly by traversing through fascia, muscle or bone. This observation gave rise to Taylor’s ‘angiosome’ concept, in which angiosomes refer to three- dimensional blocks of tissue including skin and deeper tissue layers that are supplied by specific source arteries. Thus, any skin or other tissue types can be detached as a ‘flap’ provided the vessel course from the source vessel to the end organ that is to be transferred is kept intact. - Cutaneous nerves tend to run axially out of the major nerve trunks but are less defined than most perforating blood vessels. It is possible to coapt nerve ends between a cutaneous nerve within a flap and one at the recipient site, so-called , ‘neurotisation’, to r egain some sensation in the flap. -

Figure 47.1 Pedicled groin /f_l ap. Full-thickness burn wounds over the dorsum of multiple digits. The exposed extensor tendons were covered by a pedicled groin /f_l ap. The pedicle was divided at 3 weeks and the digits were subsequently separated in stages. Figure 47.2 Three views of an anterolateral thigh /f_l ap on detachment from the donor site prior to anastomosis at the recipient site. Pedicle (arrow) consisting of one perforator artery and two vena comitans.

HISTORY

Although the evolution of plastic surgery as a surgical specialty is comparatively recent, with the ‘masters’ of the First World War years, including Sir Harold Gillies, a New Zealand otolaryngologist working in London, considered to be the founding fathers, its origins hark back to ancient times and - were driven by the need to treat burns, congenital deformity and acquired injuries (whether judicial, vindictive or sustained in battle). The ‘pre-scientific period’ included a description by the pioneering Indian surgeon Sushruta in 600 /uni00A0 /b.sc/c.sc/e.sc of numerous facial flaps (including a method to repair the split earlobe), which predated the forehead flap being used for nasal reconstruction by some 400 years. Anatomical under - - standing improved markedly from the mid-fifteenth century – the ‘scientific period’ – as human dissection became widely - practised and the development of printing allowed anatomical drawings to be reproduced and disseminated. During this . How - period the ‘Italian rhinoplasty’, which utilised a two-stage - brachial flap technique , was popularised by Tagliacozzi. The ‘modern period’ – from the nineteenth century to the present day – witnessed a detailed appreciation of the anatomy of the - cutaneous circulation, although the significance of the early research undertaken by Manchot took almost a century to be fully recognised, such that the random-pattern ‘waltzed’ tubed the musculocutaneous latissimus dorsi flap by Tansini (1896). This era of surgical discovery was greatly facilitated by the advent of antisepsis by Semmelweis (1847) and Lister (1883), the discovery of anaesthesia by Morton (1846), antibiotics by Fleming (1928) and immunosuppression by Hench (1949) and Calne (1962). The past 50 years have seen an explosion in the complex ity of microsurgical reconstructive techniques, culminating in vascularised composite tissue transplantation becoming part of routine clinical practice. A timeline of some of the key advances in the history of plastic surgical innova tion is given in Table 47.1 . Iginio Tansini , 1855–1943, Professor of Surgery , University of Pavia, Pavia, Italy . Ignaz Philipp Semmelweis , 1818–1865, Pr ofessor of Obstetrics, University of Pest, Pest, Hungary . Joseph Lister, Baron Lister of Lyme Re gis , 1827–1912, Professor of Surgery , University of Glasgow , Glasgow , UK. William Thomas Green Morton , 1819–1868, an American dentist. Sir Alexander Fleming , 1881–1955, a Scottish microbiologist who discovered penicillin at St Mary’s Hospital, London, UK, for which he was jointly awarded the Nobel Prize in 1945. Philip Showalter Hench , 1986–1965, Professor of Medicine, Mayo Clinic, Rochester, USA, was jointly awarded the Nobel Prize in 1950 for his pioneering work on cortisone. Sir Roy Y orke Calne , b. 1930, Emeritus Professor of Surgery , University of Cambridge, Cambridge, UK. Skin is the largest end organ, covering the body’s entire exter - nal surface. Together with its derivatives, including hair, nails and sweat glands, it forms the integumentary system. The skin serves a number of functions that are critical for survival. It provides a protective barrier against mechanical, thermal and irradiation (ultraviolet) injury and infection. It also plays a role - in homeostasis by preventing fluid loss and regulating tempera - ture. As the primary interface with the external environment, it acts as a sensory organ and also produces vitamin D. Hence restoration of the skin is essential even if the under lying struc - tures await delayed reconstruction.

TABLE 47.1 A selection of key advances in the history of plastic surgery innovation. Year Surgeon Nationality c . 1800 /uni00A0 Ancient Egypt BCE – India c . 600 /uni00A0 BCE Sushruta Rome c . 25 /uni00A0 CE Celsus Spain c . 1000 /uni00A0 CE Al-Zahrawi Sicily c . 1400 /uni00A0 CE Branca France 1789 Desault USA 1854 Hamilton UK 1862 Wood Germany 1889 Manchot France 1894 Dauriac Italy 1896 Tansini France 1912 Carrel Russian Empire and UK 1916–1917 Filatov and Gillies USA 1954 Murray UK 1968 Cobbett Australia 1973 Daniel and Taylor Australia 1978 Taylor China 1979 Yang Japan 1989 Koshima France 1998 Dubernard Taiwan 2004 Chen France 2005 Devauchelle Spain 2006 Barret Innovation Wound care techniques Local /f_l aps for nasal reconstruction Local /f_l aps for lip reconstruction Introduced catgut sutures and developed numerous surgical instruments Distant (arm) /f_l ap for nasal reconstruction Recognition of the importance of de /f_i nitive wound debridement Concept of /f_l ap ‘delay’ with the distant cross-leg /f_l ap Concept of axial pattern /f_l aps with the pedicled groin /f_l ap (Figure 47.1) Cutaneous arterial supply using cadaveric arterial injection studies First description of a pedicled muscle (rectus abdominis) /f_l ap Breast reconstruction using a pedicled musculocutaneous latissimus dorsi /f_l ap Nobel Prize for the development of vascular anastomosis and its application to organ transplantation Tubed pedicled /f_l aps and concept of ‘waltzing’ Nobel Prize for the /f_i rst renal transplant between identical twins Free toe-to-hand transfer Fr ee groin /f_l ap to foot Concept of the ‘angiosome’ Free radial for earm (‘Chinese’) /f_l ap Perforator /f_l aps (Figure 47.2) Hand transplant Vascularised lymph node transfer Partial face transplant Full face transplant

The skin’s structure consists of the outer epidermis (ecto dermal in origin), the dermis and the inner hypodermis (of mesodermal origin). The deepest layer of the epidermis is the stratum basale, where stem cells di ff erentiate into keratinocytes and migrate upwards towards the outermost stratum corneum an acellular layer made of dead keratinocytes acting as a barrier to fluid loss and protection against invasion by micro organisms. The epidermis regenerates from deeper follicular elements such as hair follicles and sweat glands. The dermis is connected to the epidermis via the basement membrane and consists of the upper papillary layer, composed of loose connective tissue, and a dee per reticular layer, which is thicker and consists of dense connective tissue and collagen fibres . The dermis houses the hair follicles, sweat glands, sen sory receptors and blood vessels. Geo ff rey Ian Taylor , contemporary , Professor of Plastic Surgery , University of Melbourne, Melbourne, Australia. skin appendages, including hair follicles, sensory receptors, neurones and blood vessels. The relative composition of these lay ers varies depend - ing on the functional requirements of the region concerned. Specialised areas such as hair-bearing scalp skin or glabrous heel skin can be challenging to reconstruct as there are limited donor sites. However, for non-specialised skin, the abdomen and groin make ideal donor sites as the y are elastic and thin and, thus, amenable to primary closure. Blood vessels are found in the dermis and hypodermis and are arranged in a number of plexuses between each anatomical layer (Figure 47.3). Ultimately , they all originate from a main feeding or sour ce vessel, via fine perforating vessels (‘perforators’) either directly or indirectly by traversing through fascia, muscle or bone. This observation gave rise to Taylor’s ‘angiosome’ concept, in which angiosomes refer to three- dimensional blocks of tissue including skin and deeper tissue layers that are supplied by specific source arteries. Thus, any skin or other tissue types can be detached as a ‘flap’ provided the vessel course from the source vessel to the end organ that is to be transferred is kept intact. - Cutaneous nerves tend to run axially out of the major nerve trunks but are less defined than most perforating blood vessels. It is possible to coapt nerve ends between a cutaneous nerve within a flap and one at the recipient site, so-called , ‘neurotisation’, to r egain some sensation in the flap. -

Figure 47.1 Pedicled groin /f_l ap. Full-thickness burn wounds over the dorsum of multiple digits. The exposed extensor tendons were covered by a pedicled groin /f_l ap. The pedicle was divided at 3 weeks and the digits were subsequently separated in stages. Figure 47.2 Three views of an anterolateral thigh /f_l ap on detachment from the donor site prior to anastomosis at the recipient site. Pedicle (arrow) consisting of one perforator artery and two vena comitans.

Revision #1
Created 2025-12-31 15:17:40 UTC by Omar Ayman
Updated 2025-12-31 15:17:40 UTC by Omar Ayman