MICROSURGERY

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Microsurgery is a surgical subspecialty that makes use of magni fication, precision tools and surgical techniques to enable the anastomosis of small blood vessels and coaptation of nerves. The diameter of a typical suture is between 0.01 and 0.03 /uni00A0 mm. The adv ent of microvascular anastomotic techniques renders it feasible to transplant tissue to every region of the body , thus vastly expanding the reconstructive armamentarium as it is no longer necessary to rely on grafts that must revascularise from an underlying wound bed or on pedicled flaps that are limited by size, length or the distance they can ‘travel’. Provided the course from the source vessel to the end organ is preserved, it is possible to transfer flaps from any region of the body to any recipient site provided an appropriate recipient vessel exists. This technique o ff ers a highly versatile and flexible approach to reconstructive surgery . Oncological reconstruction for head and neck cancer or mastectomy defects often requires the use of free flaps, provid ing superior functional and aesthetic outcomes. Typical flaps include the anterolateral thigh and deep inferior epigastric artery perf orator flaps, based on the descending branch of the lateral circumflex femoral artery and the deep inferior epi g astric artery , respectively . For complex limb injuries or osteo myelitis, microsurgical reconstruction has meant that limb salvage is now possible rather than amputation (Figure 47.26 Christian Andreas Doppler , 1803-1853, Director of the Institute of Physics, University of Vienna, Vienna, Austria. Common flaps used in this context include the gracilis or latis - simus dorsi muscle flaps. Microsur gical flaps are not always used to reconstruct skin defects. Free functional muscle flaps are used to reanimate the face or the upper limb in facial and brachial plexus palsies, respectiv ely . Free bone flaps such as the free fibular flap may also be used to reconstruct the mandible following oncological resection or to provide a strut following excision of an osteo - myelitic segment of tibia. Microsurgery has also made it possible to replant ampu - tated digits and limbs, or reconstruct missing fingers with free vascularised functioning and sensate toes (Figure 47.28). Fur - thermore, the technique has also made vascularised composite allotransplantation possible, including of the hand and face. Anastomoses are usually hand sewn (using specialist micro - instruments with the aid of an operating microscope), although the adoption of mec hanical coupler devices for venous anasto - moses is becoming increasing ly popular as they are often tech - - nically less demanding and faster than a hand-sewn approach. Supermicrosurgery involving microneurovascular anas - tomosis of vessels and coaptation of single nerve fascicles of the order of 0.3–0.8 /uni00A0 mm has further expanded the field. It has enabled the reconstruction of fingertip injuries, which traditionally would have been treated with amputation, and the crea tion of lymphaticovenous anastomosis for the treat - ment of chronic lymphoedema. MICROSURGERY

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