

Artery reconstruction

Artery reconstruction

- sutura (simple, with a venous or artificial patch – plastic surgery)
- endarterectomy (open, semi-closed)
- Direct replacement – for aneurysms
- shortening – when breaking too long a blood vessel (kinking of the carotid artery)
- implantation
- embolectomy, thrombectomy – Fogarty catheterem
- bridging (bypass)

Types of vascular replacements

1. Biological (artery or vein) – autologous, allogeneic, xenogenic (bovine);
 - a. thoracica interna – artery of elastic type, resistant to atherosclerosis;
2. artificial – knitted (polyester);
 - porous wall (must pre-precipitate);
 - well reachable, but often infected (*Staphylococcus epidermidis*);
 1. Woven
 2. cast (PTFE) – microporous wall
 3. Combined

Principles of operation

- We prepare and suture the blood vessels **subadventially** and in the procedure we use fine **atraumatic non-absorbable fibers** (e.g. Prolene®). Before reconstruction, administer heparin (1–2 mg/kg) and neutralise it with protamine (1.5 mg protamine / 1 mg heparin) before restoring flow. The flow is then restored slowly from the periphery, we control the recovery and build any bleeding.

Postoperative complications

- early – bleeding, occlusion, infection, thrombosis, perioperative peripheral embolisation, postperfusion syndrome (leaching of metabolites from previously ischemic tissues), compartment syndrome (sudden increase in tissue pressure in the compartment)
- late – occlusion, pseudoaneurysm, right aneurysm

Three basic surgical methods of passage reconstruction are used – **disobliteration**, *patch* or **bypass**.

Trombendarterectomy, deobliteration (TEA)

- The thickened inner layer of the artery (intima and the part of the media on which the thrombus usually mounts) is removed.
- **Target** – expand the lumen, get a smooth surface, adjust the transition from the deobliterated part to the untreated area.
- **Disadvantage:**
 1. large thrombogenic surface;
 2. therefore, it is used for short obliterations with high flow – A. carotis, aorta, A. iliaca comm.
- The main method is open TEA

Patch

- expansion of the lumen by suturing a patch from an autologous vein or artificial material
- can be combined with TEA

Bypass

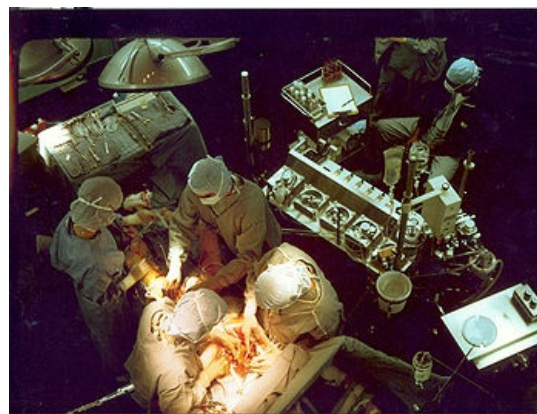
In cardiovascular surgery, the term "**bypass**" refers to the bridging of a narrowed or closed section of an artery to improve / restore perfusion of the tissue behind the narrowing.

History

- 1953 - Murray performed the first experimental coronary artery bypass (without using extracorporeal circulation).
- 1953 - Gibbon used extracorporeal circulation.
- 1968 - Sones and Favarolo began operating coronary artery bypass grafting in extracorporeal circulation using grafts from the saphenous vein in patients with CHD.

Bypass material: The following can be used to create a bypass:

- **venous graft** (v. saphena magna, v. saphena parva, superficial veins HK);
- **arterial graft** (a. thoracica (mammaria) interna, a. radialis from non-dominant HK, a. gastroepiploica dextra, a. epigastrica inferior);
- **vascular prosthesis** (vascular prostheses are used mainly in places with higher blood flow - aorta, aa. iliacae, aa. femorales; before loading vascular clamps it is necessary to fully heparin isolate the patient, heparinization is canceled after surgery);
 - porous prostheses - it is necessary to pre-coagulate the patient's own blood (strongly porous Dacron®, less porous Dacro®, Sauvage doublelevelour prosthesis);
 - non-porous prostheses - no need to pre-coagulate (Dacron® impregnated with collagen, expanded polytetrafluoroethylene, ePTFE);
- **xenograft** (bovine a. mammaria).



Cardiac surgery reconstruction of the coronary artery 1

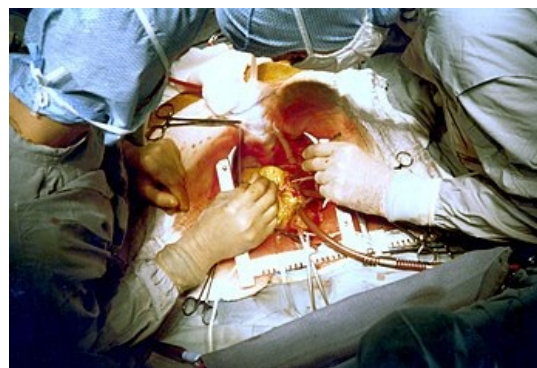
A vascular prosthesis or xenograft carries a higher risk of complications. They are therefore used only in cases where we do not have our own graft (ie for example in repeated reoperations).

Bypass management method:

- **Anatomically** - along the original vessel (aortofemoral bypass, femoropopliteal);
- **extraanatomically** - outside the course of the original vessel (axillofemoral, femorofemoral).

Vein use in situ vs. reverse graft.

- **Use of a vein in situ** (we tie larger branches; we remove the valves with a special deletion; we connect the proximal part of the vein to the proximal part of the artery, the distal part of the vein to the distal part of the artery);
- **Reverse graft** (extirpate the vein, ligate all branches, connect the proximal end of the vein to the distal end of the artery and the distal end of the vein to the proximal end of the artery - so that the venous valves do not impede blood flow).



Cardiac surgery reconstruction of the coronary artery 2

Links

External links

- Template:Akutně

Related Articles

- Coronary artery disease
- Chronic ischemic disease of the lower extremities
- Capping of large veins
- Acute arterial occlusion

Ref

- VAŇĚK, Ivan. *Kardiovaskulární chirurgie*. 1. edition. Karolinum, 2003. 236 pp. ISBN 80-2460-523-6.

Bibliography

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- VANĚK, Ivan, et al. *Kardiovaskulární chirurgie*. 1. edition. Karolinum, 2003. 236 pp. ISBN 8024605236.

Source

- BENEŠ, Jiří. *Otázky z chirurgie* [online]. ©2007. [cit. 14.5.2010]. <<http://jirben2.chytrak.cz/materialy/chira/cevni.doc>>.
- 1. VANĚK, Ivan, et al. *Cardiovascular surgery*. 1. edition. Prague : Karolinum, 2003. 236 pp. ISBN 8024605236.