

AKUTE INKORTING VAN ARTERIËLE TOEVOER: VERBETERDE VOORUITSIGTE  
MET OPERATIEWE BEHANDELING

'n Sestig-jarige man kry skielik 'n 'kramp' in sy kuit, en kort daarna voel sy voet 'dood' en kan hy sy tone nie meer beweeg nie. Sy geneesheer stuur hom bed-toe en skryf krampwerende middels voor. Na drie dae is daar geen verbetering nie. Hy word na die hospitaal toe gestuur waar sy been bo die knie afgesit word, omdat vroeë gangreen reeds ingetree het. . . Hierdie tragiese verloop van sake is 'n alledaagse gebeurtenis en word deur die meeste geneesheer as min of meer onvermydelik aanvaar. Die moderne direkte arteriële chirurgie bied egter vir 'n redelike aantal van hierdie pasiënte hoop op behoud van hulle ledemate, *mits hulle betyds geopereer kan word.*

Akute inkorting van arteriële toevoer kan volg op arteriële embolisme of trombose (meestal bo-op aterosklerose) of op besering wat deurkluwing van, druk op, trombose, of spasme van 'n slagaaar kan veroorsaak. Die beste kans op herstel van die bloedsomloop in sulke gevalle lê in die rigting van operatiewe behandeling liewers as in afwagende konserwatiewe behandeling. Ons wil nie hier die besonderhede oor die verskillende prosedures, waarvan die chirurg gebruik kan maak, behandel nie. Wat ons egter wel wil doen is om 'n kort oorsig oor sommige van die probleme in hierdie verband te gee.

1. Primêre obstruksie is op sigself gewoonlik redelik maklik hanteerbaar. 'n Embolus kan uitgehaal word (embolektomie), 'n kort trombose kan deur trombo-endarterektomie verwyder word; 'n lang trombose kan deur 'n omleidingstransplantaat omseil word; en 'n aneurisma met trombose, bv. in die arteria poplitea, kan verwyder en met 'n transplantaat vervang word.

2. Die aanwesigheid van sekondêre donkerrooi stolsel, wat distaal tot die primêre obstruksie afwaarts strek en soms feitlik die hele slagaaar vul, het die chirurg vroeër soms moedeloos gemaak. Deesdae word dikwels van proksimaalwaartse spoeling vanuit 'n distale klein slagaaartjie gebruik gemaak om van hierdie stolsel ontslae te raak. Deur hierdie maatreël tesame met ander kunsies toe te pas, kan die distale slagaaar gewoonlik weer van sekondêre stolsel bevry word.

3. Permanente afsluiting, bv. deur aterosklerose, van meer distaalgeleë slagare wat te klein is vir direkte chirurgiese ingrepe, bly nog 'n onoorkomelike moeilikheid. Hierdie moeilikheid is daarvoor verantwoordelik dat sommige ledemate wat op hierdie manier aangetas is tog sonder meer afgesit moet word.

4. Die doodgaan van weefsel as gevolg van isgemie van te lange duur, bring mee dat herstel van die bloedsomloop nie meer die dooie weefsels sal kan help nie. Hoe lank neem dit voordat weefsel onherstelbaar beskadig word, d.w.s. doodgaan? Soveel faktore is hierby betrokke dat geen vaste antwoord gegee kan word nie. Daar word dikwels gesê dat na agt uur van die begin van die arteriële afsluiting af (byvoorbeeld a.g.v. 'n embolus), dit nutteloos is om die afsluiting op te hef omdat die distale weefsels reeds dood sal wees. *Dit is glad nie noodwendig waar nie.* Daar is al menig-

vuldige gevalle beskryf wat na 'n langer afsluitingstyd (bv. ses-en-dertig uur) herstel het. Die verklaring hiervoor is hoofsaaklik dat 'n groter of kleiner hoeveelheid kollaterale sirkulasie yir langer of korter tye weefseldood kan afweer. Klaarblyklik is die kans dat weefseldood sal intree kleiner met korter tye van inkorting van die arteriële toevoer. Die praktiese gevolgtrekking is maklik: die geneesheer moet probeer om die pasiënt met akute arteriële afsluiting so gou moontlik (liefs binne agt uur) te besorg by 'n hospitaal waar hy geopereer kan word; maar hy moet *nie* die geval as hope-loos beskou bloot omdat 'n arbitrêre tyd van bv. agt uur verstryk het nie. Die voorkoming van hierdie probleem van onomkeerbare weefseldood lê dus meer dikwels in die hande van die algemene praktisyn as van die chirurg.

5. Kan herstel van bloedsomloop ooit lewensgevaarlik wees? Hoewel dit in die literatuur oor die onderwerp nie sterk gestel word nie, is dit na aanleiding van ons onder-vinding met die sogenaamde 'tourniquetskok', met die ver-gruisingsindroom, en met spesifieke gevalle van arteriële afsluiting duidelik dat die herstel van die bloedsomloop van weefsels, wat onderhewig was aan 'n ernstige graad van isgemie, lewensgevaarlik kan wees. Dit is so omdat giftige stowwe uit die isgemiese dele lewensbelangrike organe erg kan beskadig. Die besluit of hy in gevalle van afsluiting van lang duur die bloedsomloop moet probeer herstel om die ledemaat te probeer red, of the ledemaat moet amputeer om die lewe van die pasiënt te probeer red, stel hoë eise aan die oordeel van die chirurg.

As gevolg van hierdie verskillende probleme waarmee die chirurg in sulke gevalle te kampe het, kan nie verwag word dat daar in alle gevalle daarin geslaag sal word om die ledemaat te red nie. Trouens, dit is waarskynlik dat op die oomblik miskien maar 'n derde tot die helfte van hierdie ledemate met akute arteriële obstruksie deur operasie herstel word. Maar die herstel van selfs net een derde tot die helfte van hierdie ledemate is veel beter as die klein aantal wat waarskynlik met konserwatiewe behandeling alleen gered sou kon word. Die aantal wat herstel, behoort toe te neem namate die tyd-perk van isgemie verkort word deurdat die pasiënt betyds na die chirurg gebring word.

Om dit vir die pasiënt met akute arteriële afsluiting moontlik te maak om voordeel te trek uit die nuwe ontwikkelinge in die arteriële chirurgie, is dit nodig dat sy huisarts, eerstens, die toestand sal herken, tweedens, bewys sal wees van die moontlikhede van operatiewe behandeling en, derdens, sal sorg dat hy so gou moontlik gebring word na 'n plek waar die nodige fasiliteite beskikbaar is.

Wat die diagnose betref, behoort skielike pyn, 'doeie gevoel', en koudheid of verlamming van 'n ledemaat tot 'n ondersoek van die polse aanleiding te gee. Afwesige polse, saam met een of meer van die genoemde simptome, moet voorlopig as bewys van arteriële inkorting beskou word,



en hierdie bevindinge regverdig die vervoer van die pasiënt na 'n geskikte hospitaal. 'n Waarskuwing is nodig dat die diagnose van 'n akute skyfletsel of heupjig in gevalle met die genoemde simptome, moontlik tot vertraging mag lei. Die bevinding van afwesige distale polse behoort te voorkom dat arteriële inkorting vir hierdie soort toestande aangesien word.

Wanneer die definitiewe diagnose van akute arteriële afsluiting gemaak of vermoed word, moet die pasiënt onmiddellik na 'n hospitaal geneem word waar fasiliteite vir behandeling van hierdie soort geval beskikbaar is. *Tyd hier deurslaggewend want die toestand is veel dringender as akute appendicitis.*

#### THERAPEUTIC ASPECTS OF ACUTE IMPAIRMENT OF THE PERIPHERAL ARTERIAL CIRCULATION

A sixty-year-old man feels a sudden cramp in his calf. Soon afterwards his foot feels numb and he is unable to move his toes. His doctor puts him to bed and prescribes anti-spasmodics. After three days there is no improvement in his condition. He is admitted to hospital where his leg is amputated above the knee because gangrene has set in. . . . This tragic course of events occurs frequently and is accepted by most doctors as more or less inevitable. If, however, an operation is performed immediately, it may be possible to save the limbs of many people afflicted in this way by the application of modern direct arterial surgery.

Acute impairment of arterial circulation can be the result of embolism or thrombosis (often superimposed on atherosclerosis), or of injury causing severance of, pressure on, or thrombosis or spasm of an artery. Operative treatment rather than delayed conservative treatment is indicated in cases of this nature. We do not intend describing the *methods* of treatment used by surgeons, but wish to give a short survey of some of the problems encountered in this connection.

1. Primary obstruction as such is usually readily amenable to treatment. An embolism can be removed (embolectomy). A short thrombosis can be removed by thrombo-endarterectomy; a long thrombus can be circumvented by a transplantation; and an aneurysm with thrombosis (e.g. in the popliteal artery) can be removed and a transplantation carried out.

2. Previously, surgeons were disheartened by finding a secondary deep-red coagulated mass, extending distally from the primary obstruction and filling the whole artery. Today a mass such as this can often be washed away in a proximal direction by starting in a small distal artery. By employing this method, as well as other 'tricks', the coagulated mass can usually be cleared out of the distal artery.

3. The management of distal arteries which are completely occluded and which are too small for direct surgical intervention, remains an insurmountable problem resulting in the ultimate inevitable loss of limbs.

4. As a result of the death of tissue, due to ischaemia which has lasted too long, it becomes impossible for this tissue to utilize a repaired circulation. How long does it take tissues to become damaged irreparably, i.e. to die? It is difficult to reply to this question because so many factors are involved. It is often stated that it is futile to try to terminate an acute occlusion eight hours after the commencement of the occlusion (e.g. by an embolus), because by this time the tissues would have died. *This is not necessarily true.* Many cases have been described where recovery took place after an occlusion that lasted for thirty-six hours. The obvious explanation in such cases is that the death of tissue can be staved off for longer or shorter periods by a more or less adequate collateral circulation. The chances that tissues may die are clearly less when the periods of impairment of arterial supply are shorter. The practical conclusions are obvious: If the doctor suspects acute arterial occlusion, he should arrange for the patient's

immediate admission to a hospital where an operation can be performed (preferably within eight hours). The doctor should however *not* regard the case as hopeless just because an arbitrary period of eight hours has elapsed. The prevention of this problem of irreversible destruction of tissue more often rests with the general practitioner than with the surgeon.

5. Can the repair of circulation be dangerous to life? Although this aspect has not been particularly stressed in the literature, it is clear, on the basis of experience with cases of so-called tourniquet shock, the crush syndrome, and arterial occlusion, that the restoration of the circulation after serious ischaemia of tissues can be dangerous, because toxic substances from ischaemic areas can cause serious damage to vital organs. The surgeon's judgment is often put to a severe test by the following dilemma: should he try to restore the circulation in order to save a limb, or should he amputate the limb in order to save the patient's life?

In view of all the problems which the surgeon has to face in this connection, success cannot be expected in every case in which impairment of the circulation threatens the preservation of a limb. In fact, at present it is probably unlikely that it will be possible to save, by operation, the affected limbs in more than approximately a third to a half of the cases of acute arterial obstruction. However, even this number of successes is much greater than the number of cases that recover on conservative treatment alone. It should be possible to achieve still greater success provided surgical attention can be given to the patient at an early stage.

In order to enable a patient to derive the greatest possible benefit from the newer methods of arterial surgery, it is imperative, firstly, that the general practitioner should recognize the condition early; secondly, that he should be aware of the possibilities of operative treatment; and, thirdly, that he should make arrangements for the patient to be admitted, as early as possible, to an institution where the facilities are available for operative treatment.

Sudden pain in a limb, or a 'numb feeling' or coldness or paralysis of a limb should always point to the necessity for examining the pulses. Absent pulses in conjunction with one or more of the abovementioned symptoms should be interpreted as presumptive evidence of the impairment of arterial circulation and it should warrant the transport of the patient to a suitable hospital.

The diagnosis of an acute disc lesion (sciatica) in cases with these symptoms, may possibly lead to a delay in instituting treatment. The finding of absent distal pulses should prevent the possibility of an incorrect diagnosis.

Whenever a definite or presumptive diagnosis of acute arterial occlusion is made, the patient should immediately be transferred to a suitable hospital where facilities are available for the treatment of this type of case. *In these cases time is the decisive factor—even more so than in cases of acute appendicitis.*