luzerner kantonsspital
LUZERN SURSEE WOLHUSEN

Department of Vascular Surgery | LUKS – Lucerne Cantonal Hospital

Diabetisches Fusssyndrom und chronische Fussläsionen: multimodale Therapieansätze

Prof. Dr. med. Nicolas Attigah, FEBVS

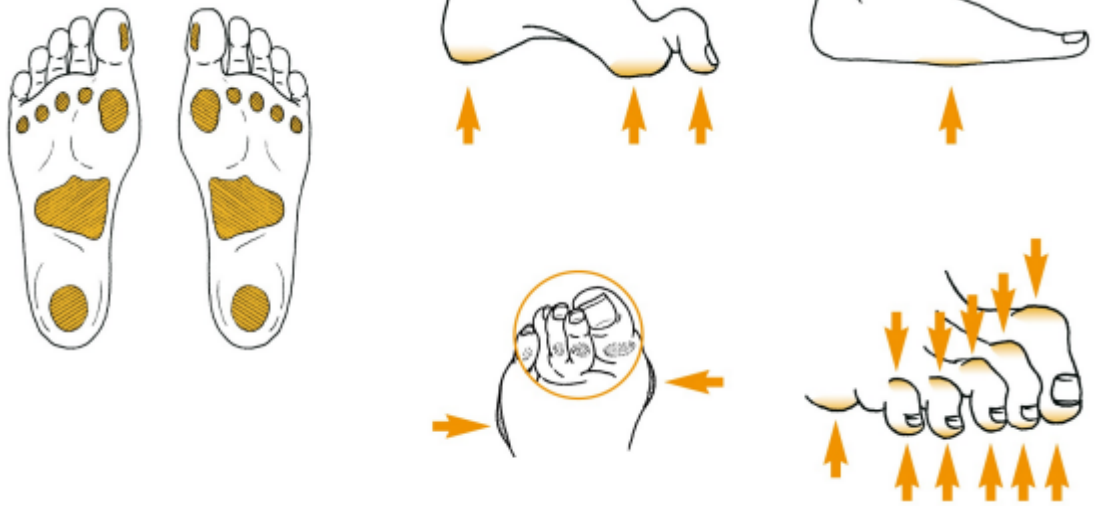
29. April, 2025 – 19. Luzerner Wundtag, KKL

Interessenkonflikt: Keiner

Agenda

- Epidemiologie
- Diagnostik
- Chirurgische Revaskularisation
- Endovaskuläre Revaskularisation
- Interdisziplinarität

Pathogenese



Callus-Bildung

Einblutung

Hautdefekt

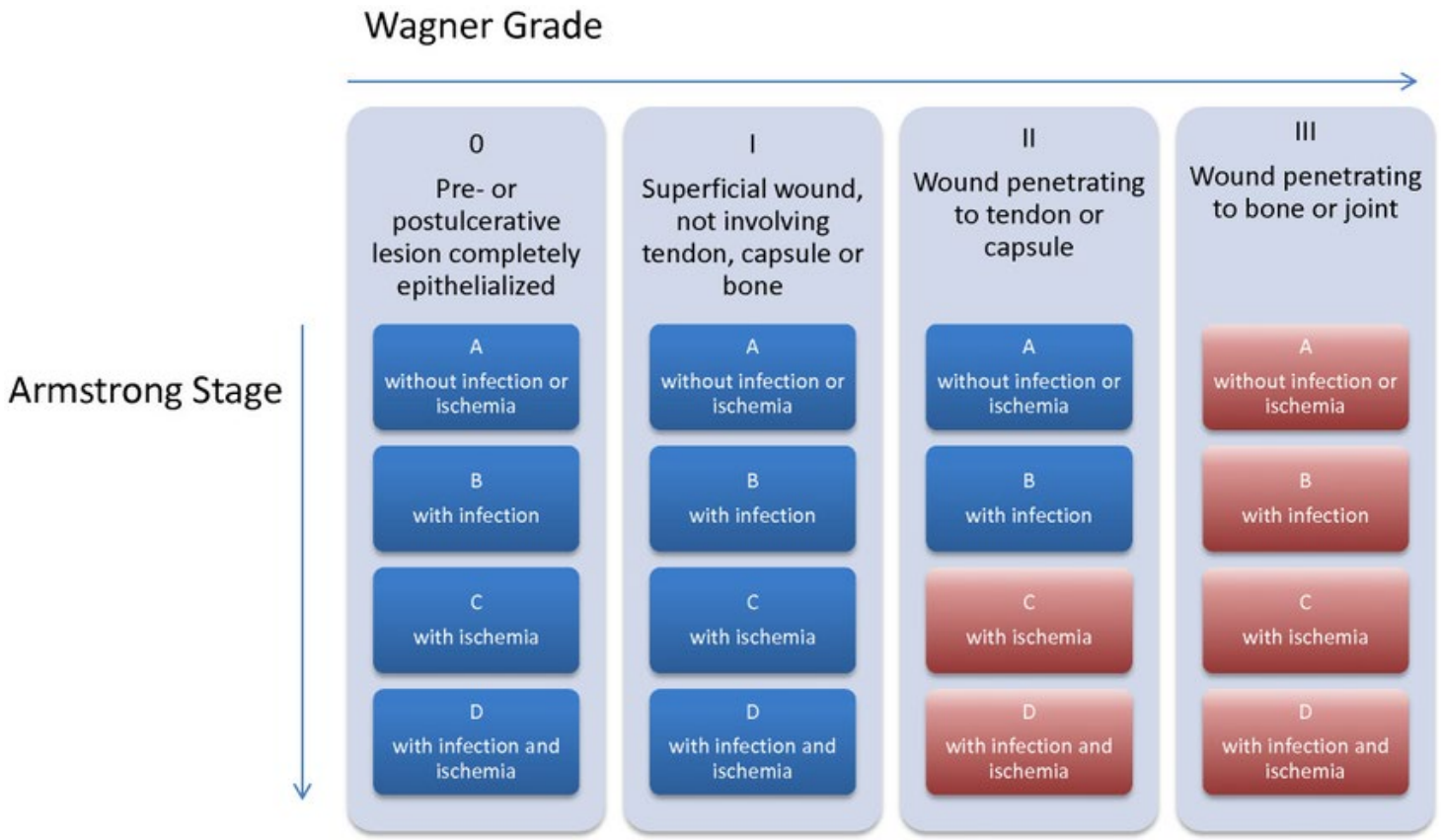
Tiefer Infekt/Osteitis

Koinzidenz von:

- Diabetes
- Verschlusskrankheit
- Polyneuropathie
- Ggf. Osteoathropathie
- Unwissen
- Sorglosigkeit

https://iwgdfguidelines.org/guidelines-2023/

Einteilung / Klassifizierung



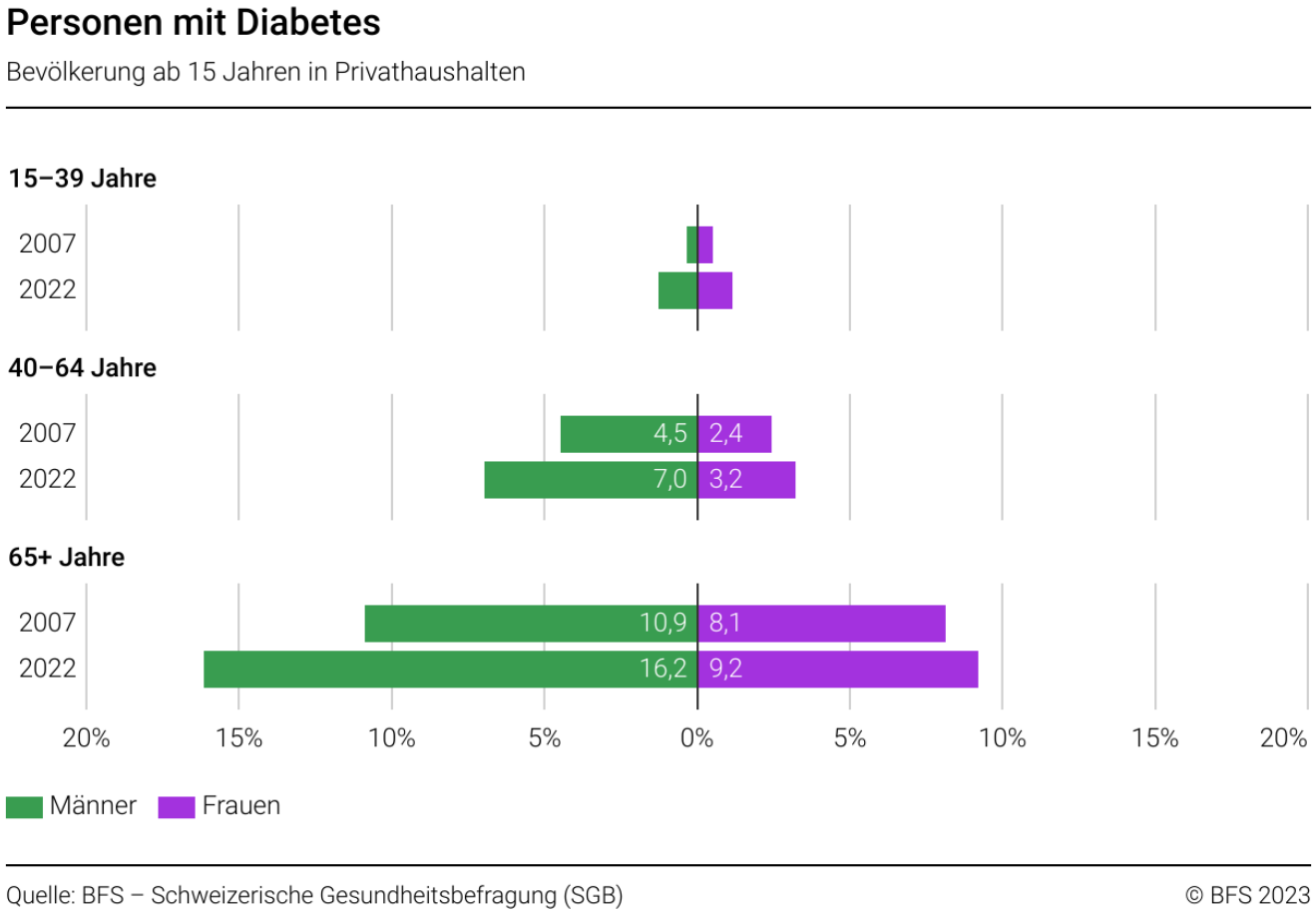
Wagner FW *Foot Ankle* 1981; 2:64-122

525. 000 Einwohner mit Diabetes
Davon 50.000, mit Typ I

Weltweit 425 Millionen Diabetiker

2045 738.000 Mio

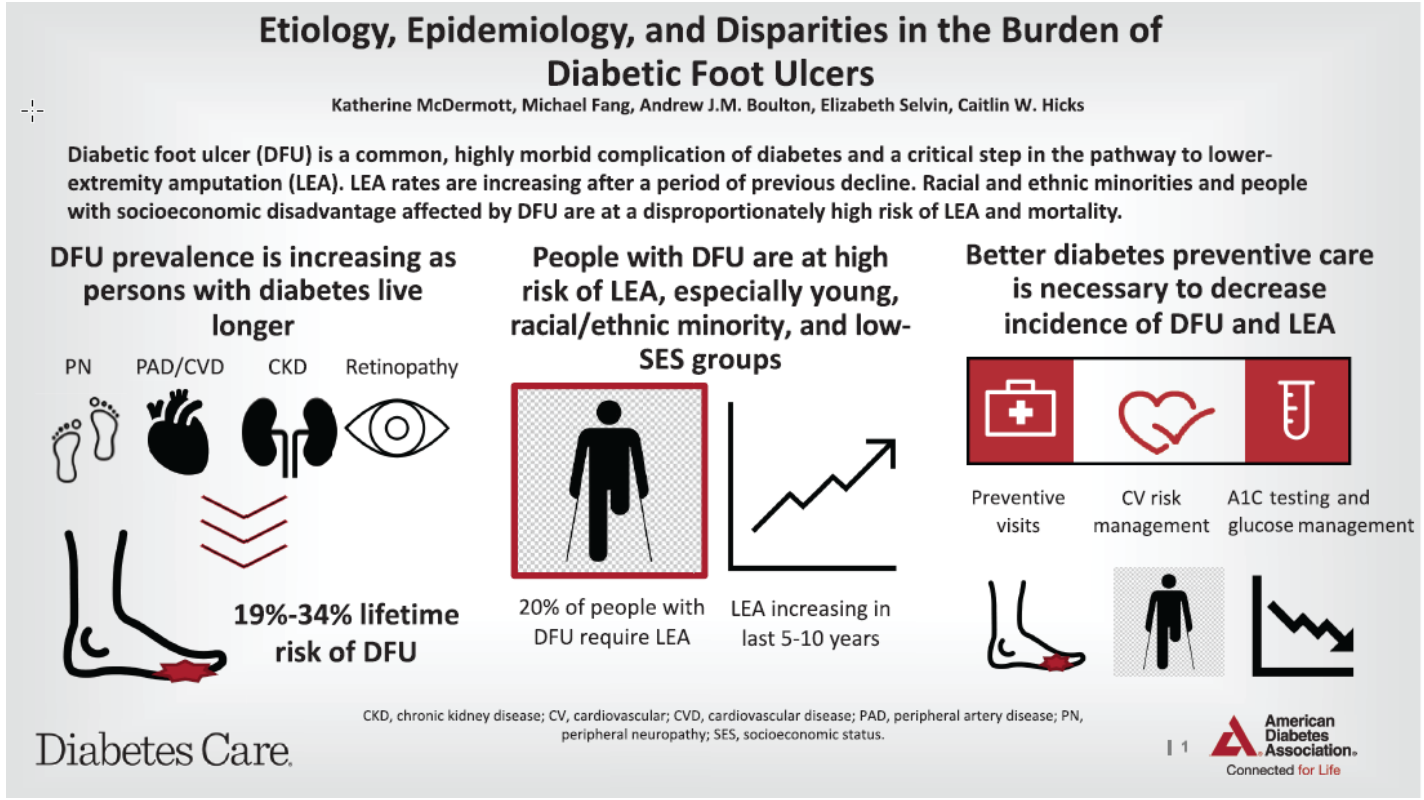
7 Jahre bis zur Diagnose



https://www.bfs.admin.ch/bfs/de/home/statistiken/gesundheit/gesundheitszustand/krankheiten/diabetes.assetdetail.28465320.html

Diabetes Care
American Diabetes Association

Etiology, Epidemiology, and Disparities in the Burden of Diabetic Foot Ulcers



Diabetisches Fusssyndrom (DFS) Risiko 19-34%

Rezidivrisiko (DFS) 65% (3-5 Jahre)

Amputationsinzidenz (DFS) 20-50%

5-Jahres Mortalität (DFS) 50-70%

McDermott K et al Diabetes Care *2023*; 46: 209-21 https://10.2337/dci22-0043

Review

The global burden of diabetic foot disease

Andrew J M Boulton, Loretta Vileikyte, Gunnel Ragnarson-Tennvall, Jan Apelqvist

Diabetic foot problems are common throughout the world, resulting in major economic consequences for the patients, their families, and society. Foot ulcers are more likely to be of neuropathic origin, and therefore eminently preventable, in developing countries, which will experience the greatest rise in the prevalence of type 2 diabetes in the next 20 years. People at greatest risk of ulceration can easily be identified by careful clinical examination of the feet: education and frequent follow-up is indicated for these patients. When assessing the economic effects of diabetic foot disease, it is important to remember that rates of recurrence of foot ulcers are very high, being greater than 50% after 3 years. Costing should therefore include not only the immediate ulcer episode, but also social services, home care, and subsequent ulcer episodes. A broader view of total resource use should include some estimate of quality of life and the final outcome. An integrated care approach with regular screening and education of patients at risk requires low expenditure and has the potential to reduce the cost of health care.

Lancet 2005; 366: 1719–24

Department of Medicine, University of Manchester, Manchester, UK (Prof A J M Boulton FRCP, L Vileikyte MD); Division of Endocrinology, Metabolism and Diabetes, University of Miami, Miami, FL, USA (Prof A J M Boulton, L Vileikyte); Swedish Institute for Health Economics, Lund, Sweden (G Ragnarson-Tennvall PhD); and Department of Endocrinology, Malmo University Hospital, Lund University, Sweden (J Apelqvist MD)

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aboulton@med.miami.edu

As the world is facing an epidemic of type 2 diabetes and an increasing incidence of type 1 diabetes[1,2] the International Diabetes Federation has chosen to focus on the global burden of diabetic foot disease in 2005. The lifetime risk of a person with diabetes developing a foot ulcer could be as high as 25%,[3] and it is believed that every 30 seconds a lower limb is lost somewhere in the world as a consequence of diabetes.[4] The International Diabetes Foundation has therefore declared that now is the time to increase awareness of foot problems in diabetes[5] in view of the vast personal, social, medical, and economic costs of what should be one of the most preventable long-term complications of diabetes.[6]

per 100 000 per year); diabetes was associated with 25–90% of all amputations.[13]

Other collaborative groups have reported differences in diabetic foot ulcers between developed and developing countries[9] and within different European countries.[14] However, direct comparisons are difficult because of differences in populations studied and time periods over which data were obtained (table).

Europe

Most European countries have participated in the implementation of the international guidelines on diabetic foot care,[4] and many have established

American Diabetes Association®

Economic costs of diabetes 2022 (U.S.)

412.9 Mrd USD in total:

306,6 Mrd USD direct costs

106,3 MRd USD indirect cost

«Ulkus-Episode» von 2 a ≈ 30.724 USD

DFU/Amputationen 10,9 Mrd USD

Durchschnittlich 10,3 Konsultationen/a

Durchschnittlich 3.508 CHF direkte Kosten/a

250.000 Diabetiker (1998) ≈ 880.000.000 CHF

2,2 % aller Kosten im Gesundheitswesen

EUROPEAN JOURNAL OF PUBLIC HEALTH 2004; 14: 3–9

DIABETES

Direct medical costs of type 2 diabetes and its complications in Switzerland

IRMGARD SCHMITT-KOOPMANN, MATTHIAS SCHWENKGLENKS, GIATGEN A. SPINAS, THOMAS D. SZUCS *

Background: This paper analyses the direct medical costs of type 2 diabetes and its complications in Switzerland. Methods: Individual healthcare resource consumption related to type 2 diabetes and its complications was determined retrospectively in 1479 non-incident and non-dying patients over 12 months (1998–1999). Literature-derived attributable risks were used to correct for non-diabetes related macrovascular disease. Results: A total of 111 primary care physicians from 19 cantons throughout Switzerland participated. Their diabetic patients on average had 10.3 consultations per year related to this disease (95% CI: 10.0–10.7). Patients spent on average 2.7 days (95% CI: 2.2–3.3) per year in hospital due to diabetes and diabetes-related complications. Mean annual type 2 diabetes-related direct medical costs per patient amounted to CHF 3,508 / € 2,323 (95% CI: CHF 3,140–3,876 / € 2,080–2,567). They were particularly high in patients with insulin treatment or with complications. After application of attributable risks and a correction for the use of adjuvant materials, costs were CHF 3,324 / € 2,201. Assuming 250,000 patients with type 2 diabetes in Switzerland leads to an estimate of CHF 0.88 billion spent for this disease and its complications in 1998. This represents a share of about 2.2% of the country's total healthcare expenditures. Conclusion: These findings demonstrate the high economic importance of type 2 diabetes and its complications in Switzerland.

Keywords: cost of illness, economics, Europe, Switzerland, type 2 diabetes

Type 2 diabetes mellitus is one of the great challenges in public health. The number of people suffering from diabetes worldwide was estimated by the WHO at 135 million in 1995. This figure was projected to more than double by the year 2025, the reasons being ageing of the population, unhealthy diet, a sedentary lifestyle and subsequent obesity.[1,2] In relative terms about 2.1% of the world's population have diabetes, a number which is expected to increase to 3.0% by 2010.[2] Type 2 diabetes accounts for approximately 90% of all cases of diabetes in the world.

Besides its increasing health impact the economic burden of diabetes is enormous. A study conducted by the World Bank found that of 1,362 million DALYs lost to all illnesses in 1990, 7.97 million DALYs (0.59%) were lost to diabetes.[3] In the USA diabetes is known to be a major source of morbidity, mortality and economic expense.[4,5] US direct medical and indirect expenditures attributable to diabetes in 1997 were estimated at $ 98.2 billion.[5]

No empirical studies are available of the healthcare costs of diabetes in Switzerland, apart from a cost-effectiveness analysis of different management strategies for type 1 diabetes and two modelling studies on type 2 diabetes.[6–8] Data from other European countries cannot be assumed to be *a priori* applicable to Switzerland due to differing healthcare and pricing systems. This is even more true for the results of a relatively large number of US studies addressing this subject.

The aim of this study was to determine the direct medical costs of type 2 diabetes mellitus and its complications in Switzerland. A 'bottom-up' approach was used, as there are only very few aggregate healthcare data available in Switzerland. Calculations were based on the costs of the individual units of service performed.

METHODS

Physician and patient sample

From the Swiss Medical Association's 1998 list, 3,100 primary care physicians were randomly selected and invited to participate if they treated 10 or more diabetes patients. A total of 111 general practitioners and non-subspecialized internists from all over Switzerland provided information extracted from their medical charts. They were asked to include *all* patients with type 2 diabetes who attended their office during the last 12 months, in order to minimize possible selection biases. Classification of diabetes was left to their judgement and not influenced by the study group.

Data were collected between June 1998 and September 1999. Patients who were newly diagnosed or died within the reviewed time period were excluded to avoid distortions by observations with extreme values. The exclusion of newly diagnosed cases implies a strictly prevalence-based approach.

Patient data and healthcare resource utilization

Diabetes-related healthcare utilization and cost-inducing events were recorded for 12 months retrospectively. Collection of data included gender, age, age at diagnosis, type of treatment, the presence of microvascular complications (neuropathy, nephropathy, retinopathy), macrovascular complications (coronary heart disease, cerebrovascular disease, peripheral artery disease), and related events. At the resource use level, recording comprised diabetes-related medication, consultations, laboratory tests, imaging diagnostics, ambulatory procedures, hospital stays, and home healthcare. Insurance and employment status were also recorded, as well as the number of working days lost. The use of adjuvant materials like glucose monitoring devices, strips and syringes could not be assessed from the medical charts. It was estimated, at the aggregate level, from the experience available in a large Swiss outpatient diabetes unit.

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1 Division of Medical Economics, University Hospital, Zürich, Switzerland (currently none)
2 Hirslanden Research, Zürich, Switzerland
3 Division of Endocrinology and Diabetes, University Hospital, Zürich, Switzerland
Correspondence: M. Schwenkglenks, M.A., M.P.H., European Center of Pharmaceutical Medicine (ECPM), University Hospital, CH-4031 Basel, Switzerland, tel. +41 61 261 45 83, fax +41 61 261 45 84, e-mail: m.schwenkglenks@unibas.ch

Infektdiagnostik beim diabetischen Fusssyndrom:

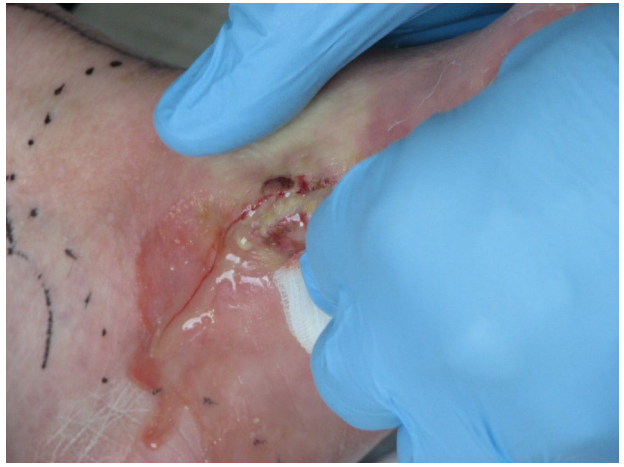
- Blutkulturen bei systemischen Infekt Zeichen und vor Beginn einer Antibiotika-Therapie
- Vermeidung von Wund-Abstrichen
- Gewebebiopsien und /oder Knochenbiopsien (probe-to-bone Test)
- Bei Osteitis histologische Untersuchung anstreben
- Frühzeitig Infektiologen involvieren

Hendrix R *Gefässchirurgie 2024;* 29:77-80

Infekt beim Diabetiker

=

Notfall!

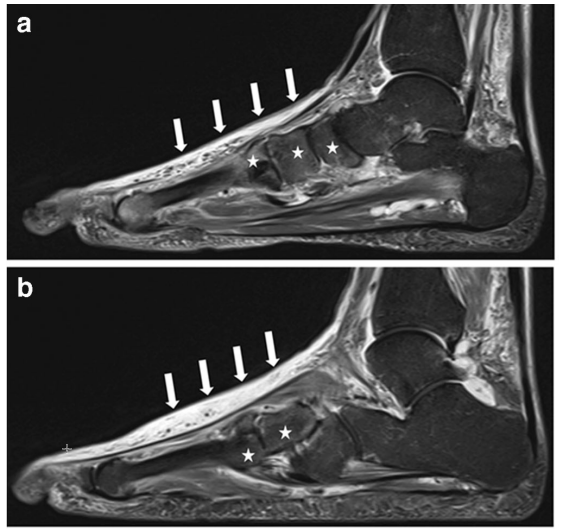


SCIENTIFIC ARTICLE

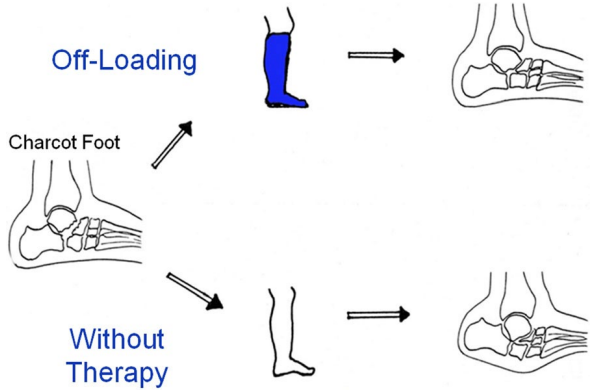
Check for updates

The "Balgrist Score" for evaluation of Charcot foot: a predictive value for duration of off-loading treatment

Martin C. Berli [1,2] · Kai Higashigaito [2,3] · Tobias Götschi [4,5] · Christian W. A. Pfirrmann [2,3] · Reto Sutter [2,3] · Andrea B. Rosskopf [2,3]



Pathogenesis not fully clear, but most likely:
«repetetive micro-trauma in foot with impaired sensation
And neurovascular changes caused by pathological innervation of the blood vessels»



Berli MC et al *Skeletal Radiol 2021;* 50:311-20
Trieb K *The Bone and Joint Journal* 2016; 98(9):1155-59

- Bei Diabetikern **ABI** in 10-30% wegen Mediasklerose nicht zur Diagnose der PAVK verwertbar (falsch hohe Werte >1.4)

- Zehendruckmessung ≤30 mmHg **(TBI)**

  Hinweis auf eine kritische Ischämie

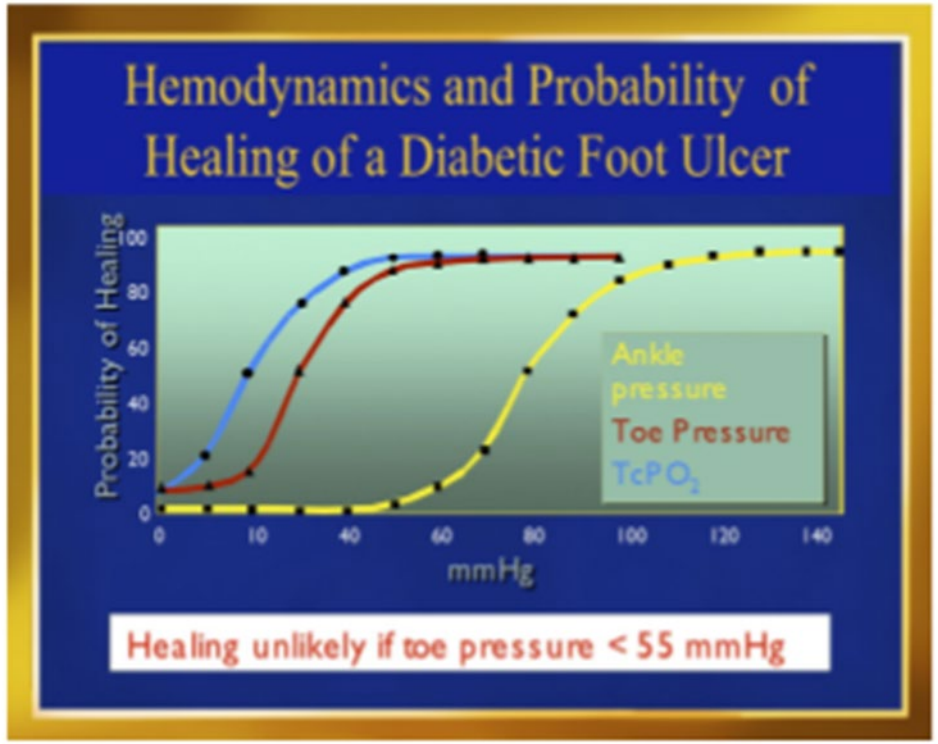


Fig. Hemodynamic testing for healing potential in a diabetic foot ulcer.

Andersen CA *J Vasc Surg* 2010; 52(3 suppl): 76s-80s

Periphere Durchblutungsstörungen

Was kann der Chirurg (immer noch) leisten ?

Straßburg 1936

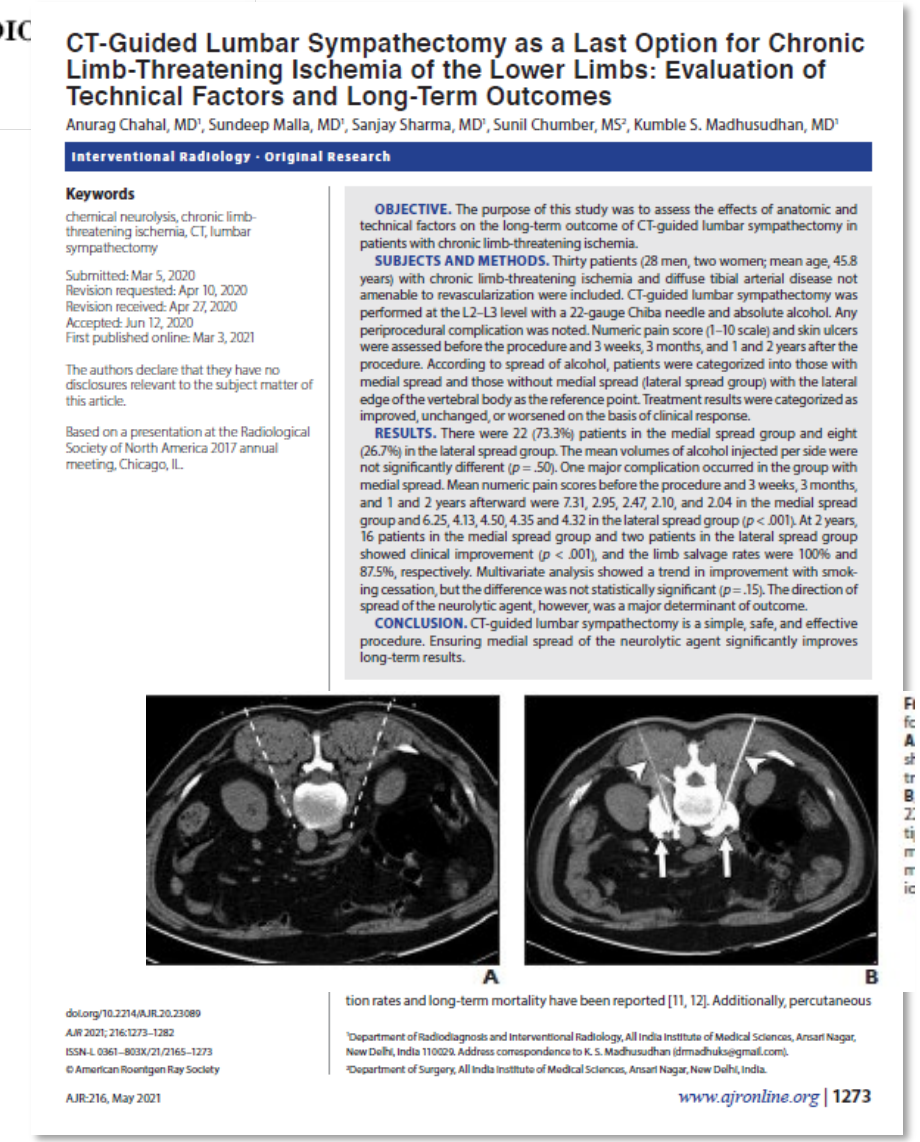
„Sympathische Chirurgie"

Réne Lériche
1879-1955

SURGERY OF THE SYMPATHETIC SYSTEM. INDIC
RESULTS *
By René Leriche, M.D.

Lériche-Syndrom

Lériche R *Press Méd* 1917; 25:513
Lériche R *Lyon Chir 1925; 22:521*



CT-Guided Lumbar Sympathectomy as a Last Option for Chronic Limb-Threatening Ischemia of the Lower Limbs: Evaluation of Technical Factors and Long-Term Outcomes

Anurag Chahal, MD[1], Sundeep Malla, MD[1], Sanjay Sharma, MD[1], Sunil Chumber, MS[2], Kumble S. Madhusudhan, MD[1]

Interventional Radiology · Original Research

Keywords
chemical neurolysis, chronic limb-threatening ischemia, CT, lumbar sympathectomy

Submitted: Mar 5, 2020
Revision requested: Apr 10, 2020
Revision received: Apr 27, 2020
Accepted: Jun 12, 2020
First published online: Mar 3, 2021

The authors declare that they have no disclosures relevant to the subject matter of this article.

Based on a presentation at the Radiological Society of North America 2017 annual meeting, Chicago, IL.

OBJECTIVE. The purpose of this study was to assess the effects of anatomic and technical factors on the long-term outcome of CT-guided lumbar sympathectomy in patients with chronic limb-threatening ischemia.

SUBJECTS AND METHODS. Thirty patients (28 men, two women; mean age, 45.8 years) with chronic limb-threatening ischemia and diffuse tibial arterial disease not amenable to revascularization were included. CT-guided lumbar sympathectomy was performed at the L2–L3 level with a 22-gauge Chiba needle and absolute alcohol. Any periprocedural complication was noted. Numeric pain score (1–10 scale) and skin ulcers were assessed before the procedure and 3 weeks, 3 months, and 1 and 2 years after the procedure. According to spread of alcohol, patients were categorized into those with medial spread and those without medial spread (lateral spread group) with the lateral edge of the vertebral body as the reference point. Treatment results were categorized as improved, unchanged, or worsened on the basis of clinical response.

RESULTS. There were 22 (73.3%) patients in the medial spread group and eight (26.7%) in the lateral spread group. The mean volumes of alcohol injected per side were not significantly different ($p = .50$). One major complication occurred in the group with medial spread. Mean numeric pain scores before the procedure and 3 weeks, 3 months, and 1 and 2 years afterward were 7.31, 2.95, 2.47, 2.10, and 2.04 in the medial spread group and 6.25, 4.13, 4.50, 4.35 and 4.32 in the lateral spread group ($p < .001$). At 2 years, 16 patients in the medial spread group and two patients in the lateral spread group showed clinical improvement ($p < .001$), and the limb salvage rates were 100% and 87.5%, respectively. Multivariate analysis showed a trend in improvement with smoking cessation, but the difference was not statistically significant ($p = .15$). The direction of spread of the neurolytic agent, however, was a major determinant of outcome.

CONCLUSION. CT-guided lumbar sympathectomy is a simple, safe, and effective procedure. Ensuring medial spread of the neurolytic agent significantly improves long-term results.

A B

tion rates and long-term mortality have been reported [11, 12]. Additionally, percutaneous

doi.org/10.2214/AJR.20.23089
AJR 2021; 216:1273–1282
ISSN-L 0361–803X/21/2165–1273

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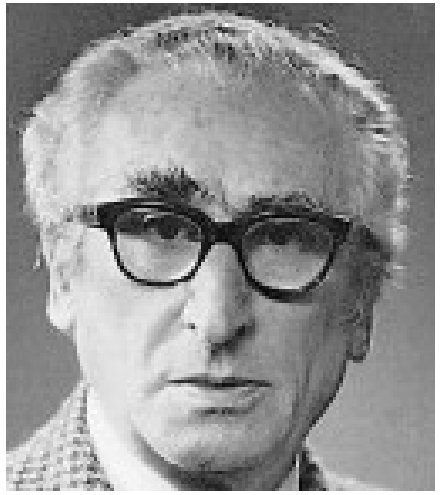
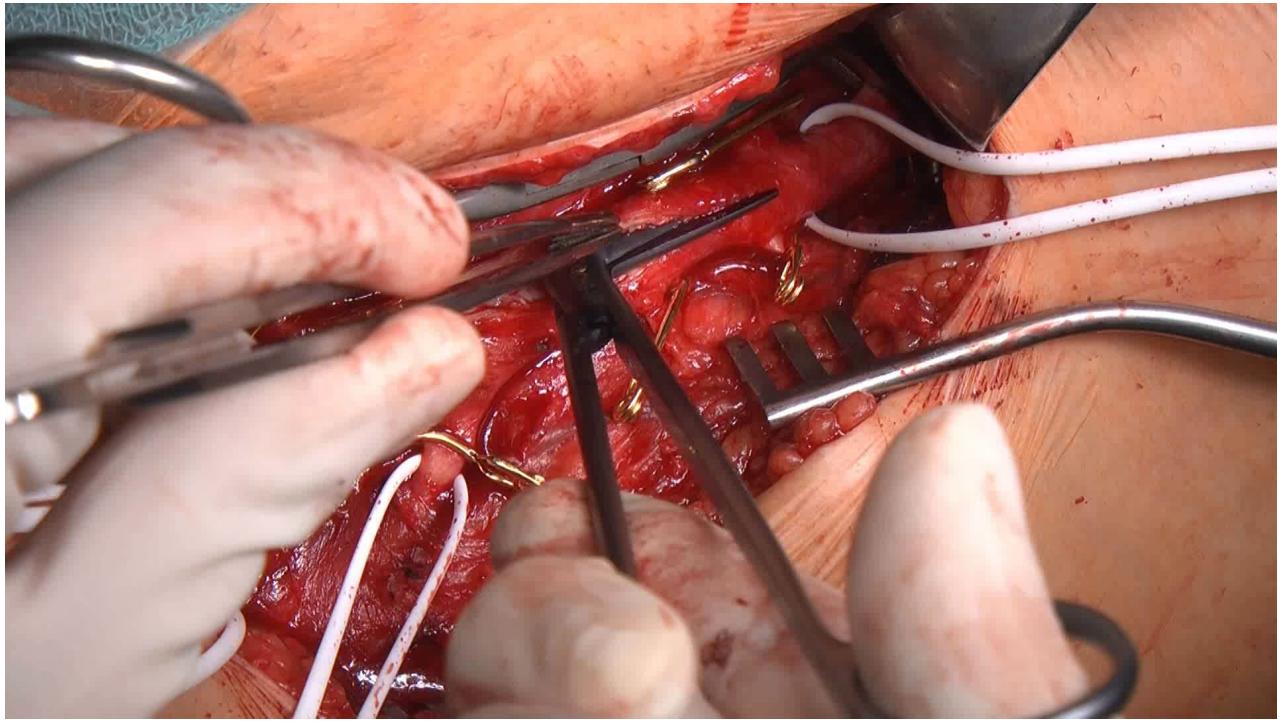
[2]Department of Surgery, All India Institute of Medical Sciences, Ansari Nagar, New Delhi, India.

Leisten-Thrombendarterektomie



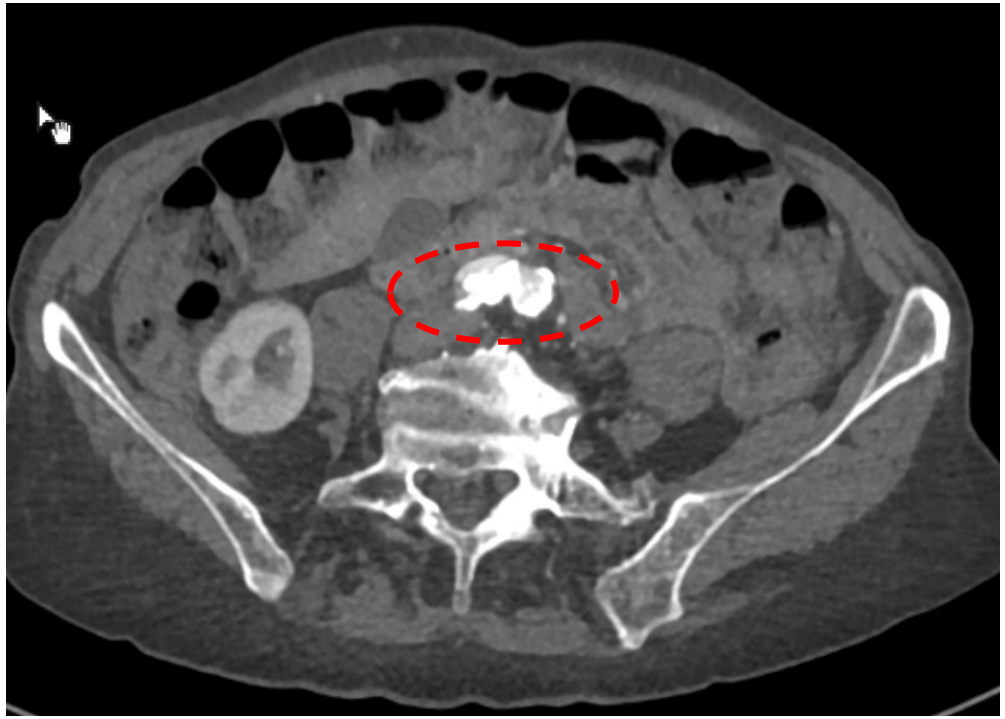
Joao C. Dos Santos
1907-1975



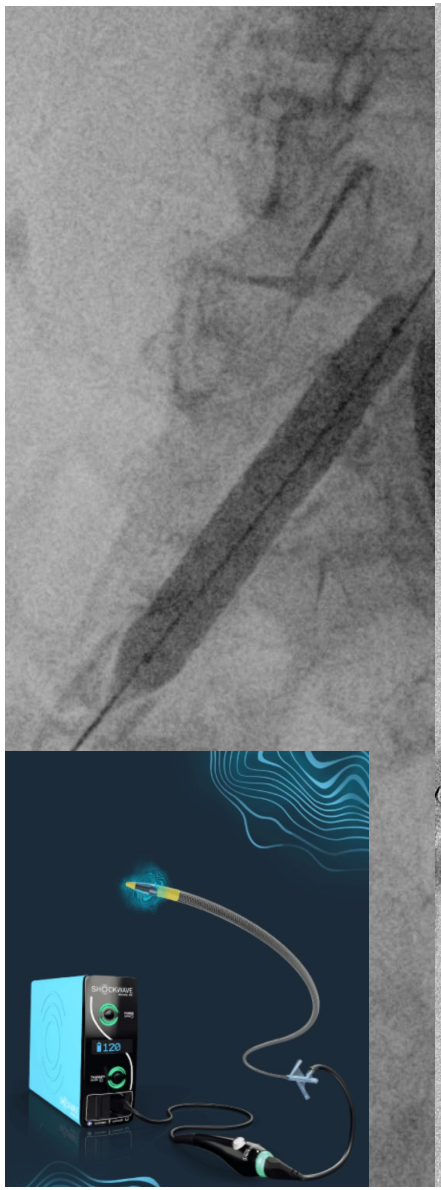
"Exactly what I had in mind was to find the plane of cleavage between the old thrombus and the intima, leaving a devastated initial wall to be coated by newly built endothelium while anticoagulation was active."

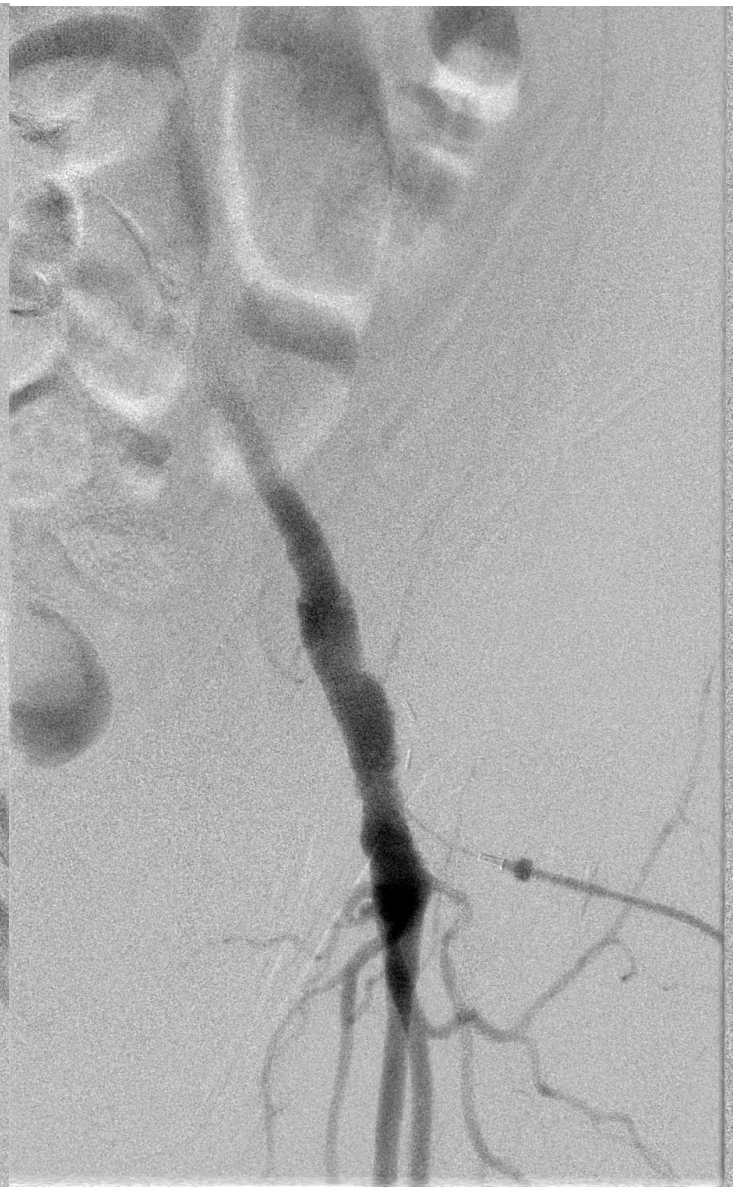
Dos Santos JC *J Cardiovasc Surg* 1976; 17:113-28

Hybrid-Revaskularisation



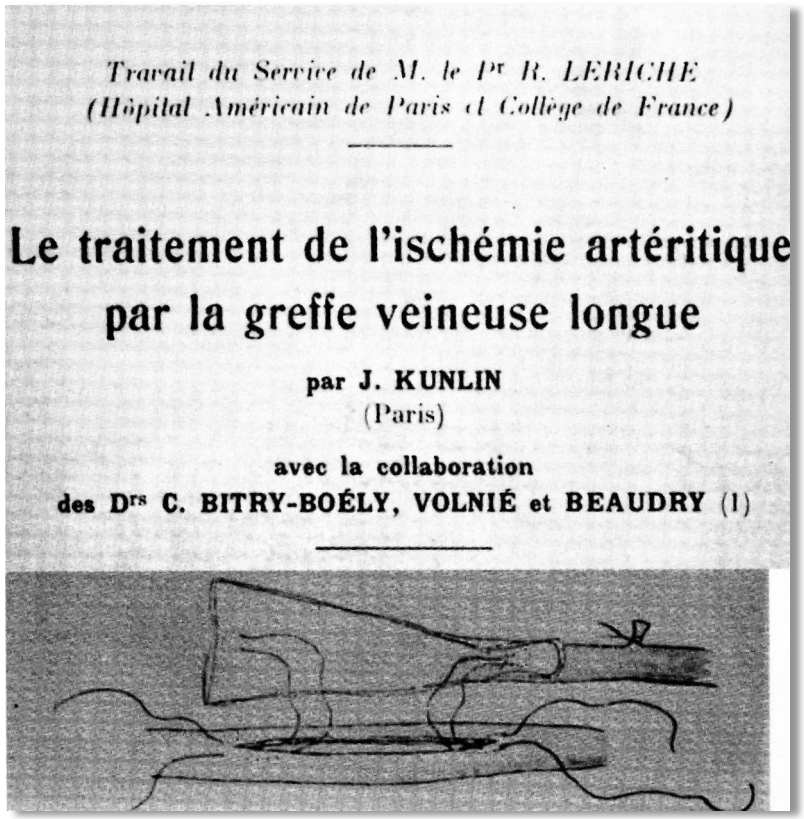
1. Shockwave-Angioplastie in «kissing»-Technik
2. Stentgraft-gestützte PTA A. iliaca bds.
3. Leisten-Thrombendarterektomie mit bovinem Patch links





Bypasschirurgie

Jean Kunlin
1904-1991

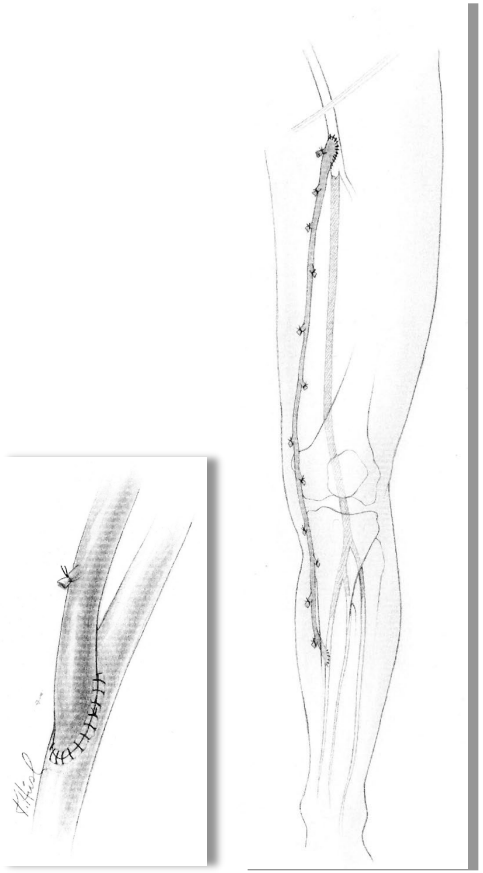


Travail du Service de M. le Pr R. LERICHE
(Hôpital Américain de Paris et Collège de France)

Le traitement de l'ischémie artéritique par la greffe veineuse longue

par J. KUNLIN
(Paris)

avec la collaboration
des Drs C. BITRY-BOÉLY, VOLNIÉ et BEAUDRY (1)



Erste erfolgreiche Venenbypass-Operation am 03.06.1948

Kunlin J *Rev Chir* 1951; 70: 206

Fallvignette #1:

Schnittzeit: 16:19 OP Dauer: 6:52 h

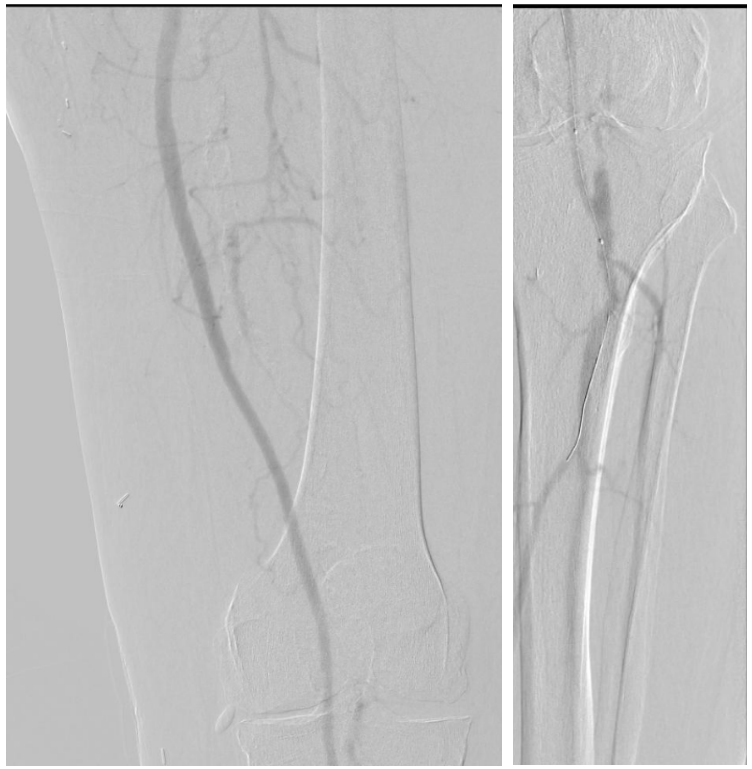
Diagnosen

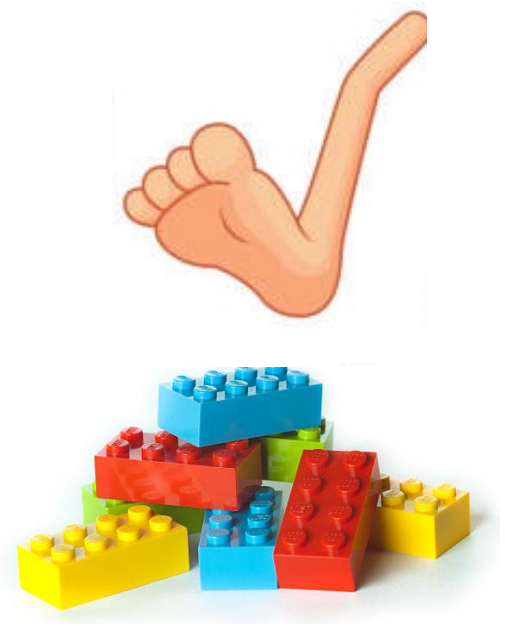
PAVK Stadium IV links mit feuchter Gangrän des Vorfusses/D1 links sowie trockener Fersennekrose mit kritischer Ischämie

Operation

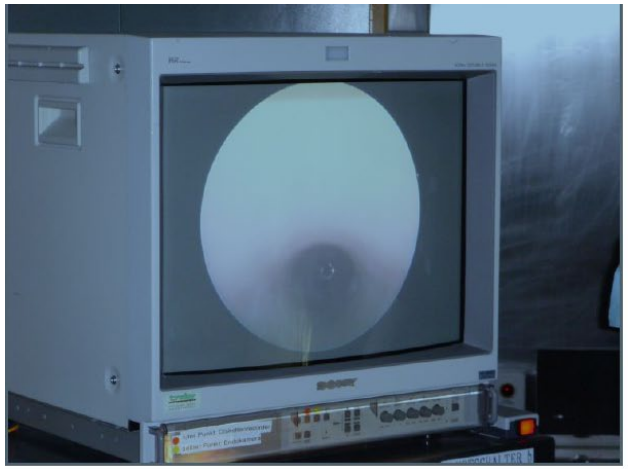
1. Thrombendarterektomie der Arteria femoralis communis sowie ostiale Thrombendarterektomie der Arteria femoralis profunda mit boviner Patchplastik Synovis Vascu-Guard
2. Anlage eines femoro-poplitealen Venen-Bypasses (Arteria femoralis communis End-zu-Seit; Arteria poplitea Pars III End-zu-Seit) Vena saphena magna non-reversed mit Vena saphena magna vom ipsilateralen Bein

Angioskopie und Sichtvalvulotomie mit den Spülvalvulotom
Intraoperative Dopplerkontrolle
Flussmessung mit und ohne Paveron
Mikrochirurgische Technik

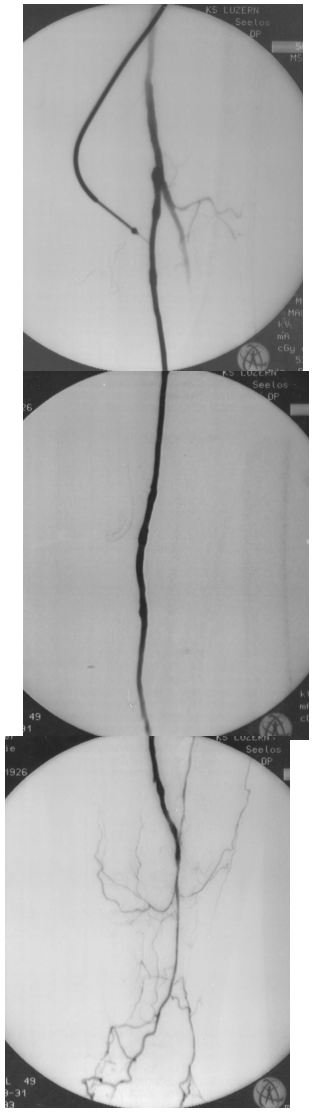




Bypass-Anlage (Vene):



Sicht -Valvulotomie



AMERICAN SOCIETY FOR MICROBIOLOGY | Infection and Immunity

Check for updates

| Bacteriology | Minireview

Triple threat: how diabetes results in worsened bacterial infections

Benjamin P. Darwitz,[1] Christopher J. Genito,[2] Lance R. Thurlow[1,2]

AUTHOR AFFILIATIONS See affiliation list on p. 12.

ABSTRACT Diabetes mellitus, characterized by impaired insulin signaling, is associated with increased incidence and severity of infections. Various diabetes-related complications contribute to exacerbated bacterial infections, including hyperglycemia, innate immune cell dysfunction, and infection with antibiotic-resistant bacterial strains. One defining symptom of diabetes is hyperglycemia, resulting in elevated blood and tissue glucose concentrations. Glucose is the preferred carbon source of several bacterial pathogens, and hyperglycemia escalates bacterial growth and virulence. Hyperglycemia promotes specific mechanisms of bacterial virulence known to contribute to infection chronicity, including tissue adherence and biofilm formation. Foot infections are a significant source of morbidity in individuals with diabetes and consist of biofilm-associated polymicrobial communities. Bacteria perform complex interspecies behaviors conducive to their growth and virulence within biofilms, including metabolic cross-feeding and altered phenotypes more tolerant to antibiotic therapeutics. Moreover, the metabolic dysfunction caused by diabetes compromises immune cell function, resulting in immune suppression. Impaired insulin signaling induces aberrations in phagocytic cells, which are crucial mediators for controlling and resolving bacterial infections. These aberrancies encompass altered cytokine profiles, the migratory and chemotactic mechanisms of neutrophils, and the metabolic reprogramming required for the oxidative burst and subsequent generation of bactericidal free radicals. Furthermore, the immune suppression caused by diabetes and the polymicrobial nature of the diabetic infection microenvironment may promote the emergence of novel strains of multidrug-resistant bacterial pathogens. This review focuses on the "triple threat" linked to worsened bacterial infections in individuals with diabetes: (i) altered nutritional availability in diabetic tissues, (ii) diabetes-associated immune suppression, and (iii) antibiotic treatment failure.

KEYWORDS diabetes, bacterial infection, antibiotic resistance, hyperglycemia, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, inflammation

Diabetes mellitus presents a significant global health crisis, with projections estimating that 783 million individuals will be diagnosed with diabetes worldwide by 2045 (1). One substantial health complication associated with diabetes is an increased vulnerability to bacterial infections, marked by higher frequency and severity compared with individuals without diabetes (2–8). Thus, understanding the intricate mechanisms underlying diabetes-associated complications and how they alter bacterial infection dynamics is fundamental for informing future research.

Diabetes is principally characterized by impaired insulin signaling cascades resulting from insufficient insulin production [type 1 diabetes (T1D)] or insulin resistance (type 2 diabetes, T2D) (9–12). T1D arises from autoimmune-mediated destruction of pancreatic islet β-cells responsible for the production and secretion of insulin (11–13). Insulin resistance and T2D develop from a complex interplay of factors, including chronic

Editor Anthony R. Richardson, University of Pittsburgh, Pittsburgh, Pennsylvania, USA

Address correspondence to Lance R. Thurlow, thurlow@email.unc.edu.

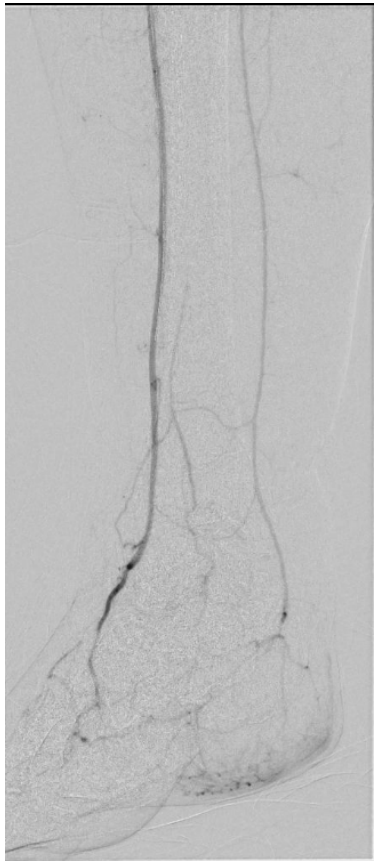
The authors declare no conflict of interest.

See the funding table on p. 12.

Published 25 March 2024

Fallvignette 2#:

68 J , weibl. Typ I Diabetes «brittle diabetes», Adipositas per magna
St.n. femoro-cruralen Venen-Bypass (ATA) und konsekutiven PTA's



Present Status of Infrainguinal Arterial Bypass Procedures Following an All Autogenous Policy – Long-Term Results of a Single Center

T. Eugster, P. Stierli, L. Guerke, T. Obeid, P. Hess

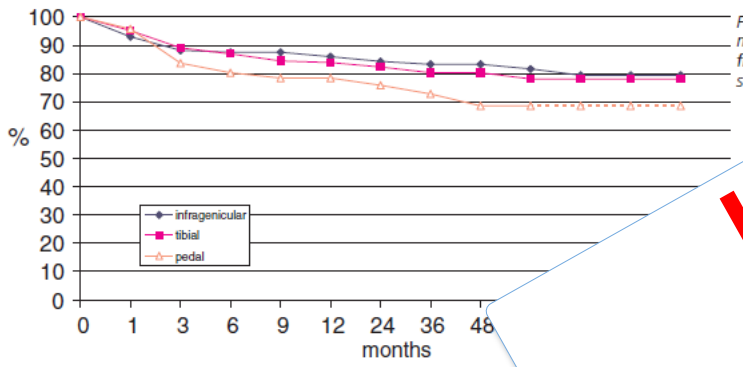


Figure 4. Life table analysis of pri-
mary assisted patency rates fo
fragenicular, tibial and ped
struction. (Dotted lin

n = 540 Bypässe (Vene)
Mortalität 0,9 %

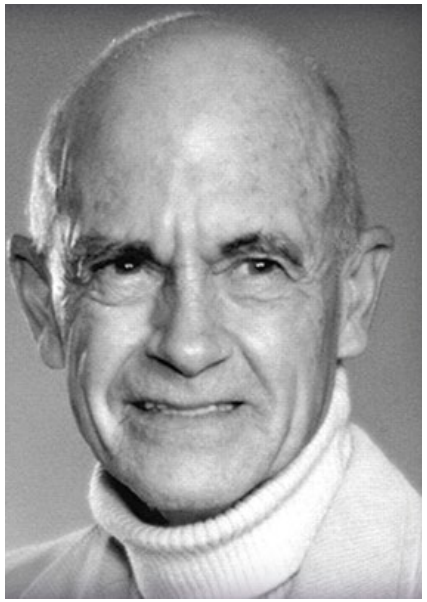
Pri ere Patency (@

- **enual 98%**
- **Infragenual 79%**
- **Crural 78%**
- **Pedal 68 % (@ 4 a)**

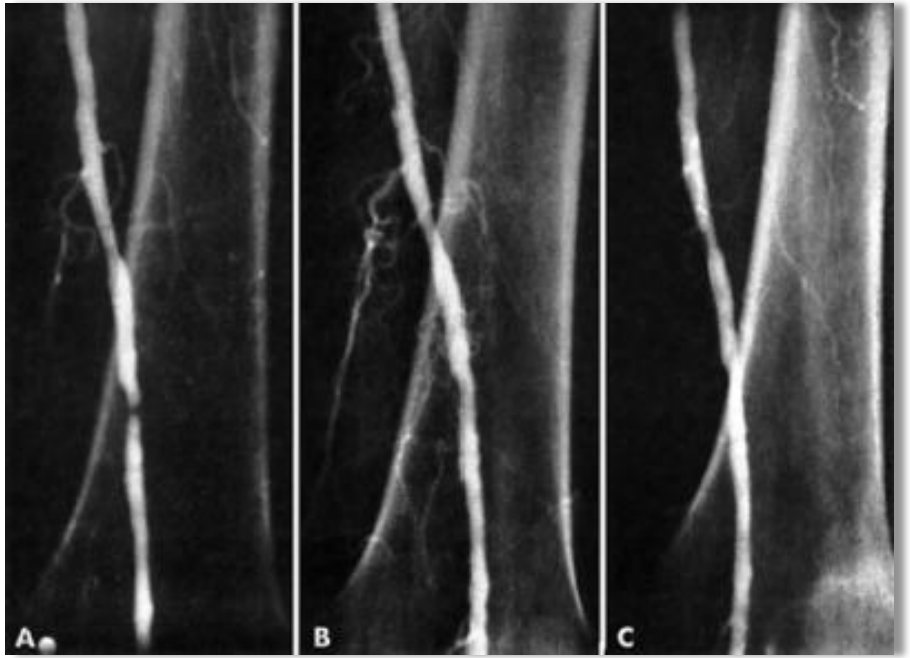
Keine Angst vor Bypässen !

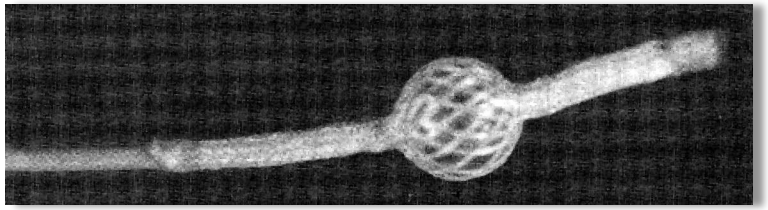
Eugster T et al. *Swiss Surgery* 2002; 8:171-175

Beginn der endovaskulären Therapie



Charles Dotter
1920-1985





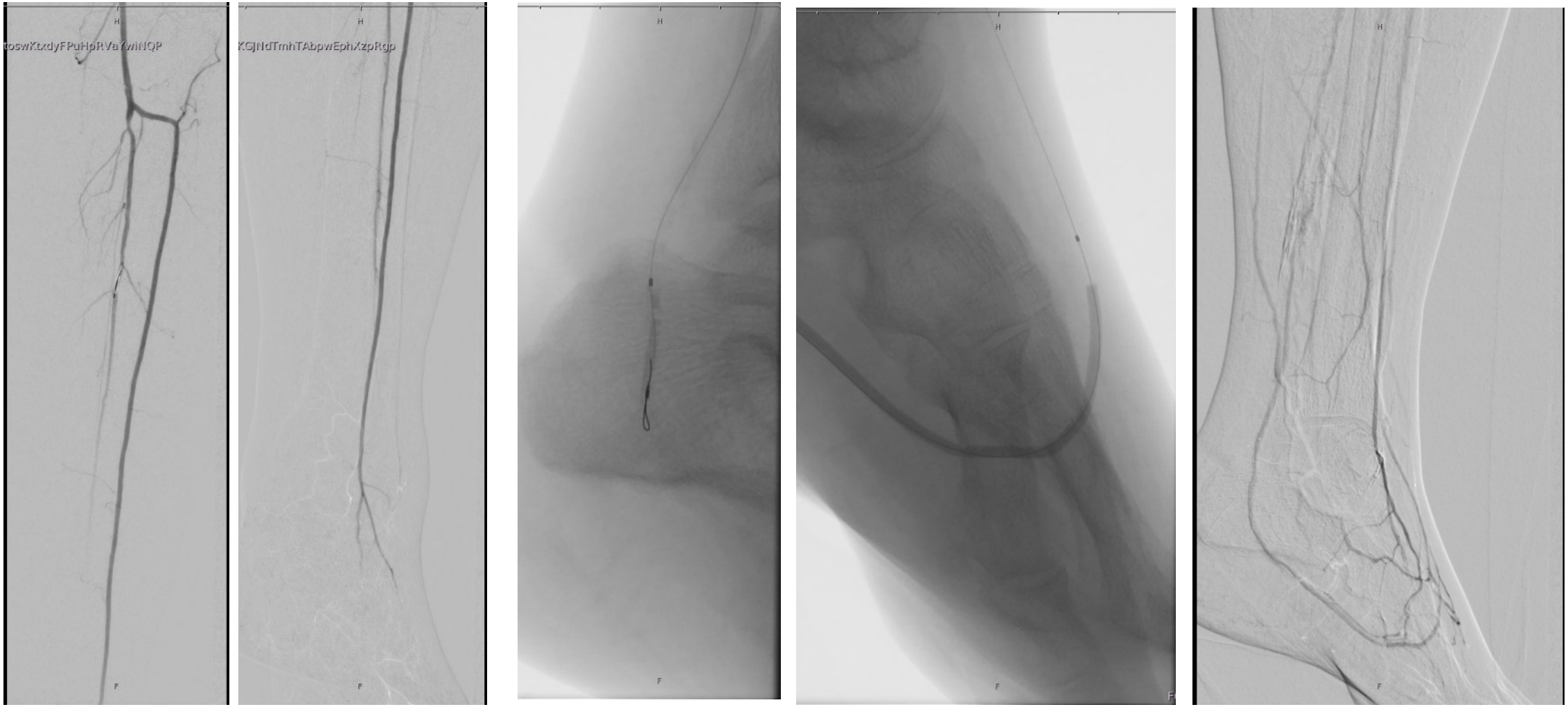
Erste Balloon-Angioplastie
16. Januar 1964

Dotter CT / Judkins MP *Circulation* 1964; 30:654

luzerner kantonsspital
LUZERN SURSEE WOLHUSEN

Fallvignette #3:

51 Jahre, weibl.
Klinik: Rutherford-Becker Class 5, Ulkus Dig. IV+V
Vorfuss Amputation geplant !



Bilder von Prof. A. Rastan
Angiologie LUKS

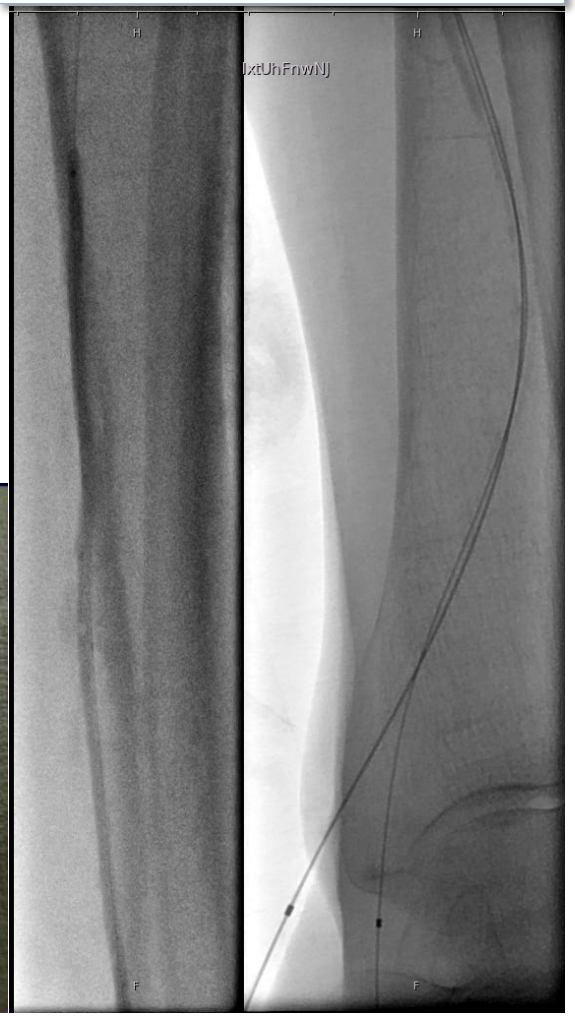
luzerner kantonsspital
LUZERN SURSEE WOLHUSEN

Fallvignette #4:

83 Jahre, weibl.
Klinik: Rutherford-Becker Class 5, Ulkus Dig. I+III
Major Amputation geplant !

Ausgangssituation

Retrograde Punktion



Endergebnis

Bilder von Prof. A. Rastan
Angiologie LUKS

Venöse «Arterialisation» offen chirurgisch oder interventionell

CLI

Venous Arterialization for CLI: When, Why, and How?

Identifying appropriate patients and techniques for treating no-option CLI with percutaneous deep vein arterialization.

BY DANIEL A.F. VAN DEN HEUVEL, MD; MICHIEL A. SCHREVE, MD; AND STEVEN KUM, MD

An aging population and the rising incidence of diabetes have contributed to the increasing number of patients with critical limb ischemia (CLI).[1,2] Although some CLI patients will achieve wound healing with conservative therapy, it is impossible to predict who these patients will be, and it is therefore recommended that revascularization remains an important first-line treatment.[3] Unfortunately, failure to achieve sufficient blood flow to the wound remains a problem in both surgical and endovascular revascularization attempts, especially for patients with diabetes and end-stage renal disease who commonly present with severe, heavily calcified stenotic and occlusive disease that frequently extends below the ankle. In this advanced disease stage, with occlusions of the pedal arteries and lack of reasonable distal targets for angioplasty or bypass surgery, there are no further options to improve perfusion of the wounds (Figure 1). In these "no-option" patients, venous arterialization could be the only way to help wounds heal, prevent major amputation, and/or relieve rest pain. This article describes the use of venous arterialization as a last-resort treatment for patients with CLI who have no other treatment options.

PATIENT SELECTION

Typically, candidates for deep vein arterialization (DVA) have Rutherford class 5 and 6 disease and no available surgical or endovascular treatment options. Patients with ischemic rest pain who fail to respond to conservative treatment and are also not candidates for surgical or endovascular treatment could also be considered DVA candidates.

When selecting patients for DVA, close attention should be paid to the clinical status of the foot. Patients with extensive tissue loss are not appropriate candidates for DVA or other forms of conventional revascularization. Critical structures, such as the deep venous arch, must be intact to achieve good flow and a well-perfused foot. In addition, it is important that infection is adequately treated by surgical drainage and antibiotics prior to performing DVA. Superficial infection at the distal venous puncture site, which is most commonly at the medial malleolar level, should be treated before the procedure to prevent graft infection.

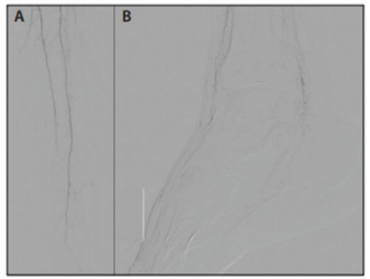


Figure 1. A no-option patient with CLI and desert foot. There is only a very small peroneal artery reaching down to the ankle (A). At the foot, there are no target vessels to perform bypass or endovascular intervention (B).

igure 3. A 0.018-inch wire across the deep venous arch in he marginal vein. The wire facilitates lysis of the valves by upporting a forward ion should be paid t ar and plantar level.

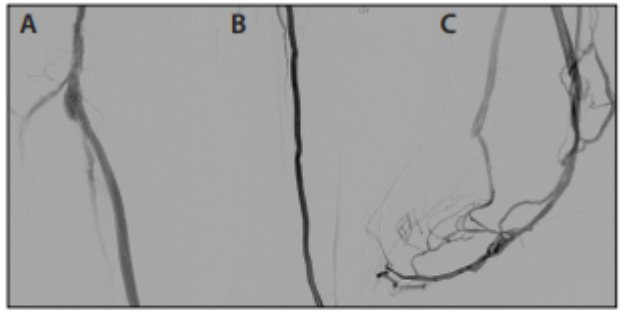
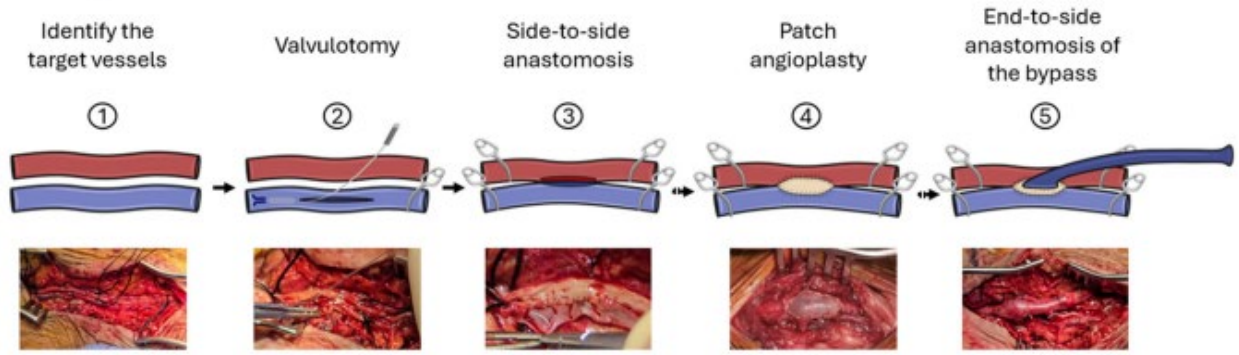


Figure 4. Completion angiogram at the crossing point showing successful DVA creation with flow through the covered stent (A). Flow through the covered extension stents and lateral plantar vein (B). Outflow is mainly via the great saphenous vein because of an obstructing wire in the deep venous arch (C).

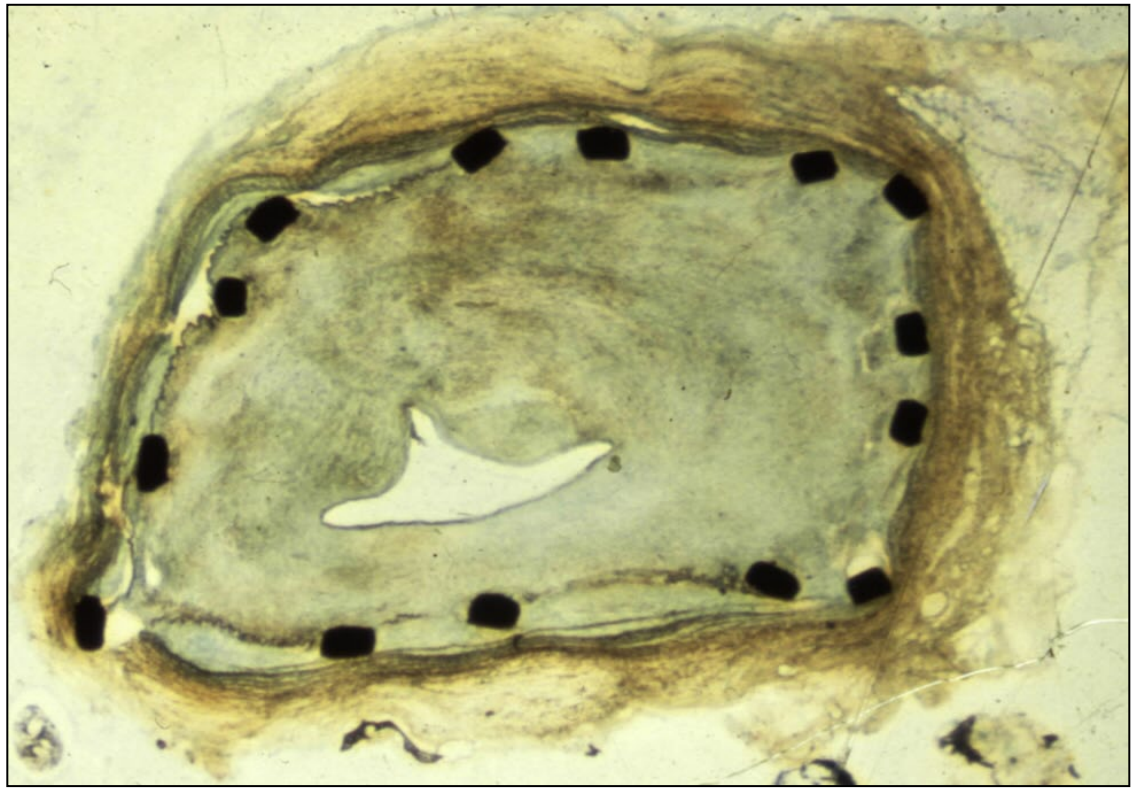


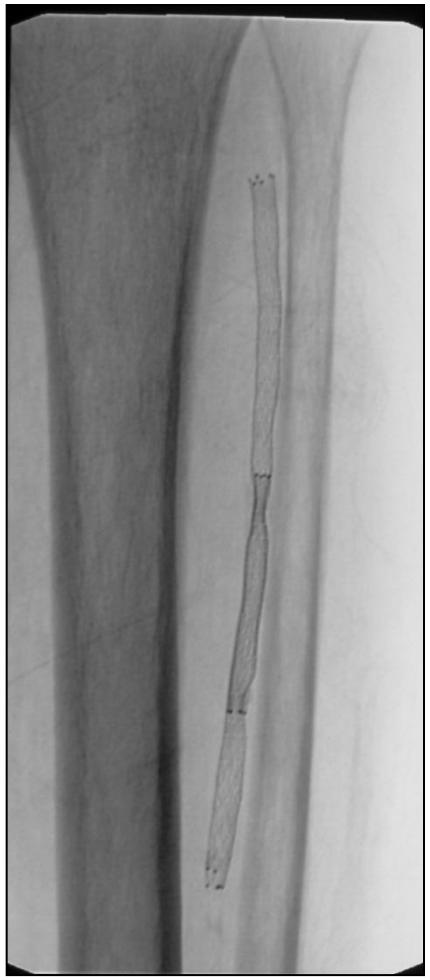
Alsabbagh Y et al. *Surg Tech Dev*. 2025; doi .org/10.3390/std14010006

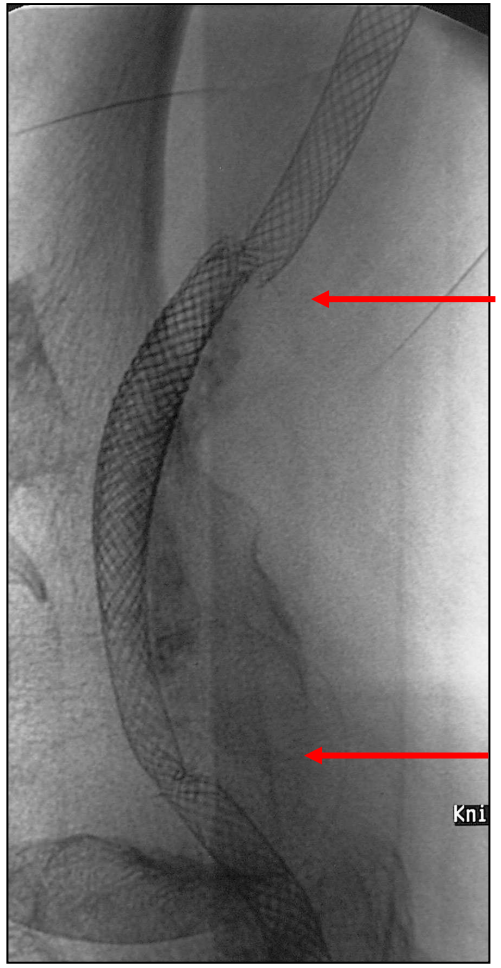
Warum versagt der Stent unterhalb des Leistenbandes?

„In-stent“ Stenosen: Recoiling,

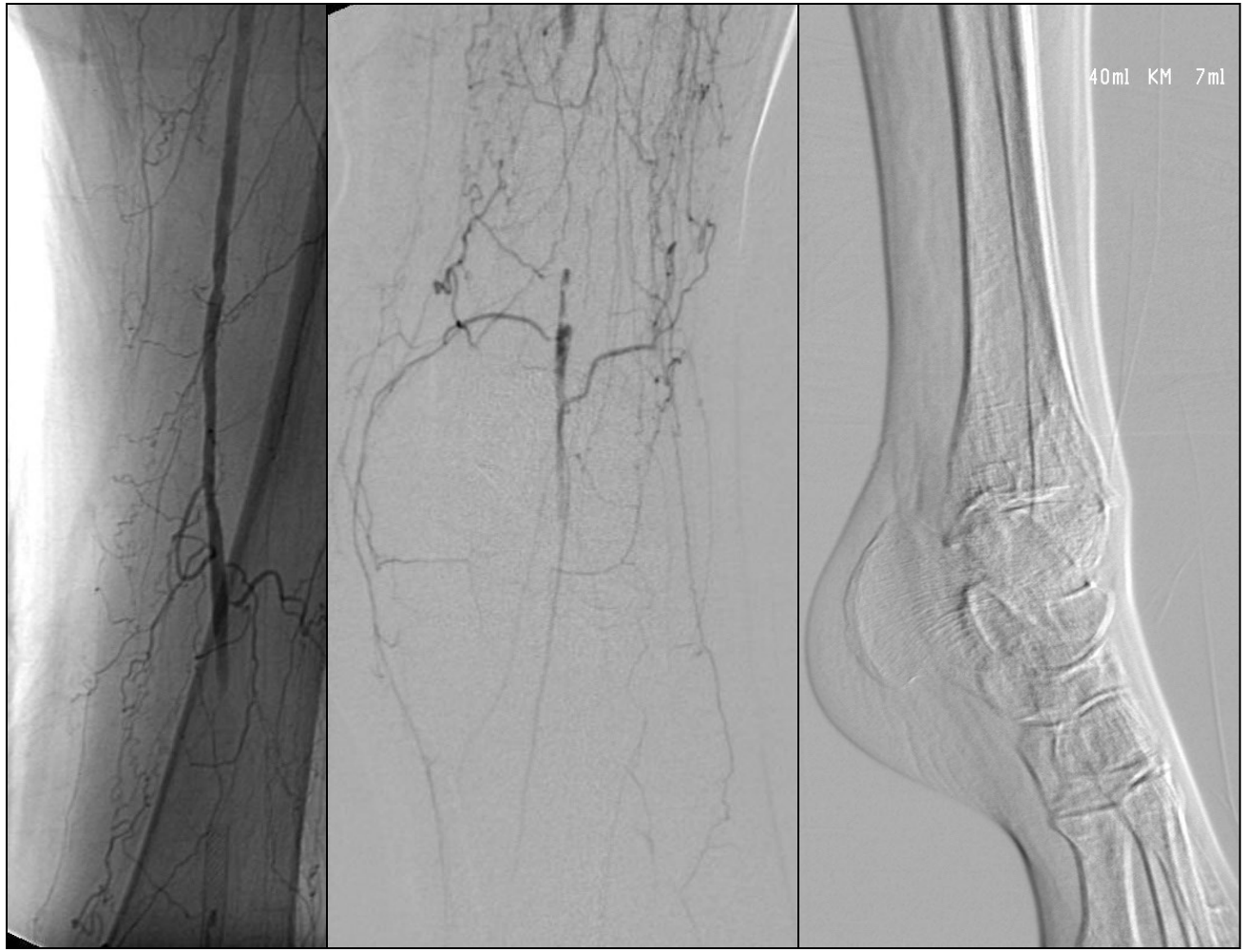
Neo-intimale Hyperplasie







„Mit dem Stent vergibt man sich nichts…“



Schlager O et al. : *J Endovasc Ther* 2005, 12: 676-684
Scheinert et al. : *LINC Kongress* 2008

Journal of Vascular Surgery®

THE MANAGEMENT OF DIABETIC FOOT: A CLINICAL PRACTICE GUIDELINE BY THE SOCIETY FOR VASCULAR SURGERY IN COLLABORATION WITH THE AMERICAN PODIATRIC MEDICAL ASSOCIATION AND THE SOCIETY FOR VASCULAR MEDICINE

Table. Suggested frequency for follow-up evaluation

Category	*Risk profile*	*Evaluation frequency*
0	Normal	Annual
1	Peripheral neuropathy	Semiannual
2	Neuropathy with deformity and/or PAD	Quarterly
3	Previous ulcer or amputation	Monthly or quarterly

PAD, Peripheral arterial disease.

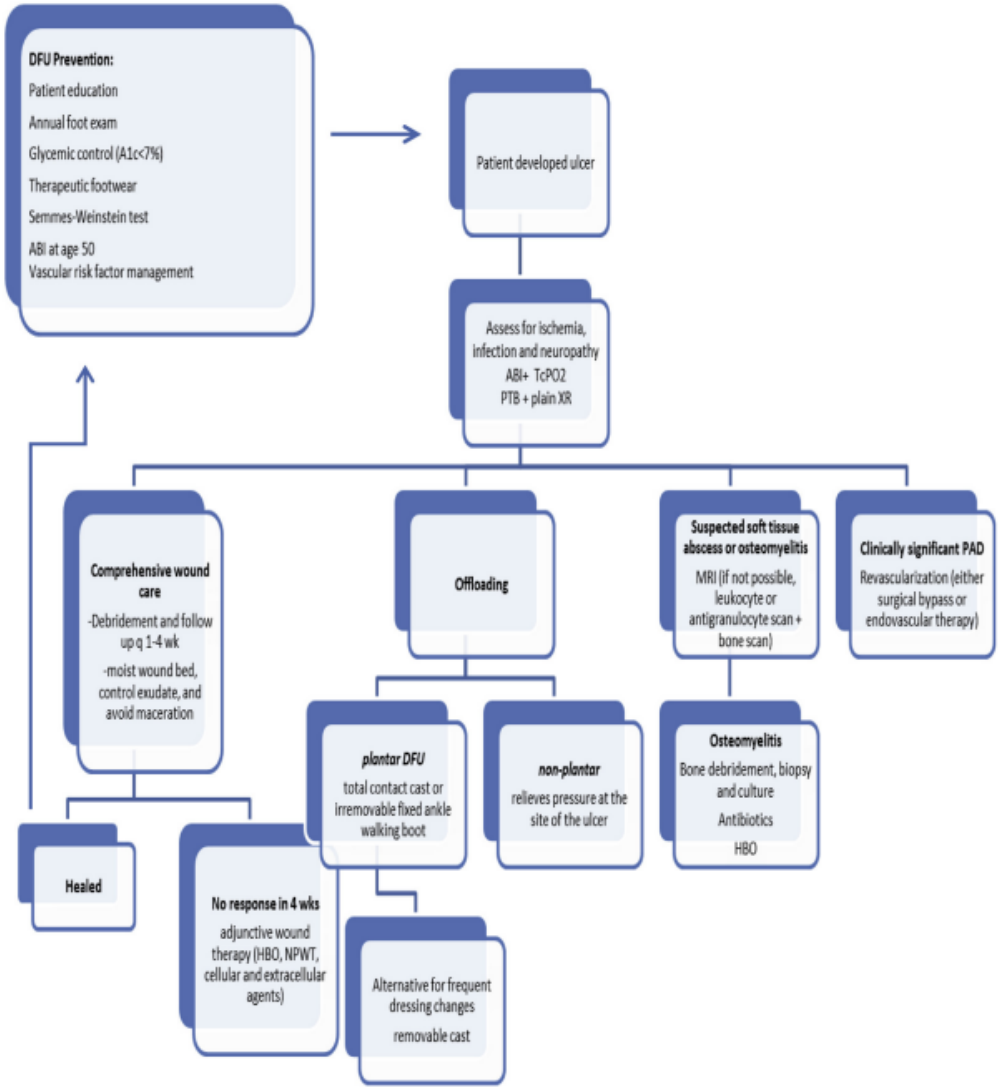
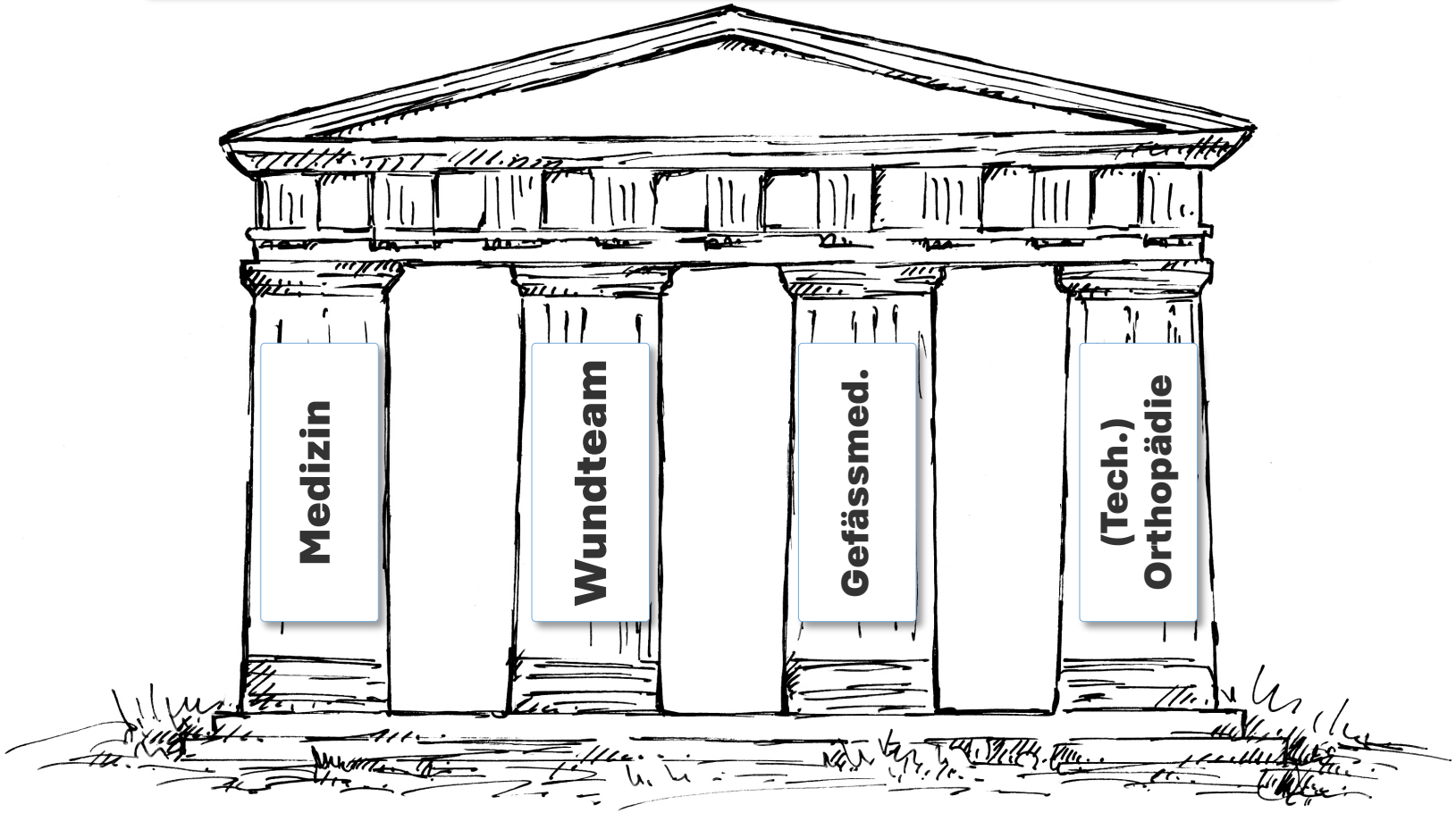


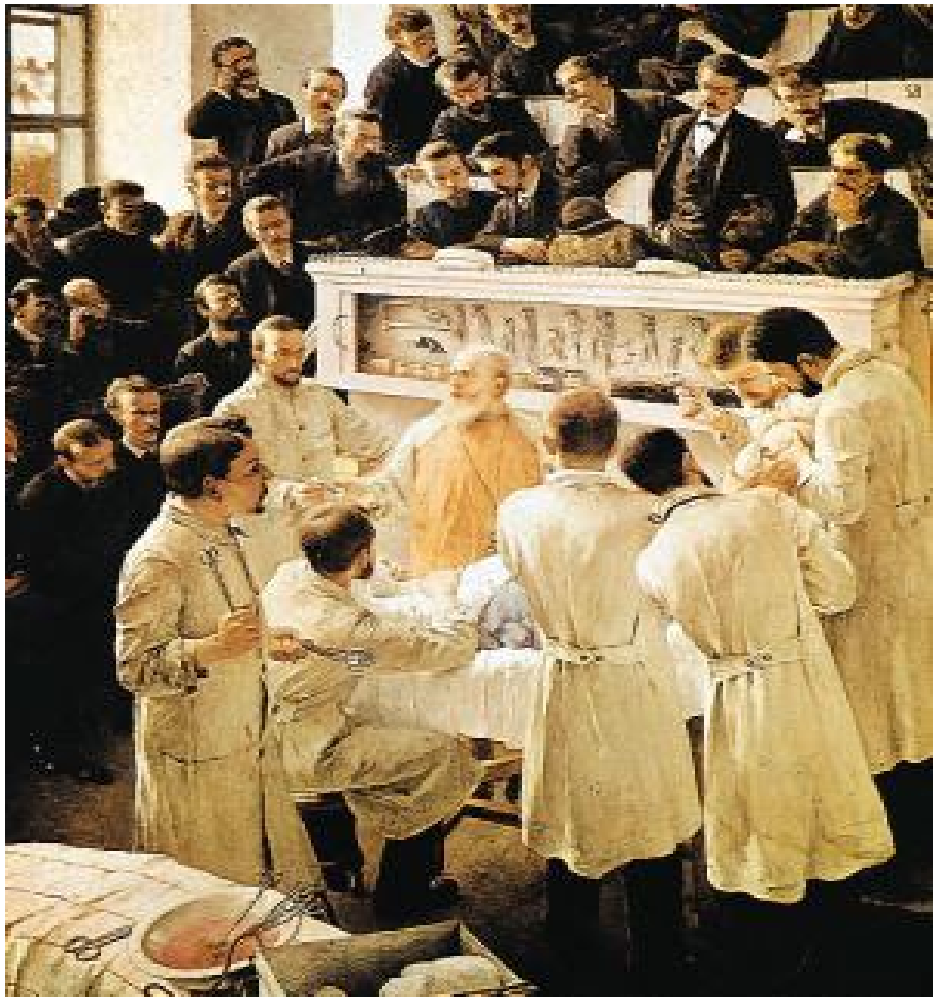
Fig. Algorithm for prevention and care of diabetic foot. *ABI*, Ankle-brachial index; *DFU*, diabetic foot ulcer; *HBO*, hyperbaric oxygen; *MRI*, magnetic resonance imaging; *NPWT*, negative pressure wound therapy; *PAD*, peripheral arterial disease; *PTB*, probe to bone; *$TcPo_2$*, transcutaneous oxygen pressure; *XR*, radiography.

Hingorani A et al. *CJ Vasc Surg* 2016; 63:2S, 29 ff

Therapieerfolg beim diabetischen Fuss



„Erst kommt das Wort,
dann die Arznei und
dann das Messer“

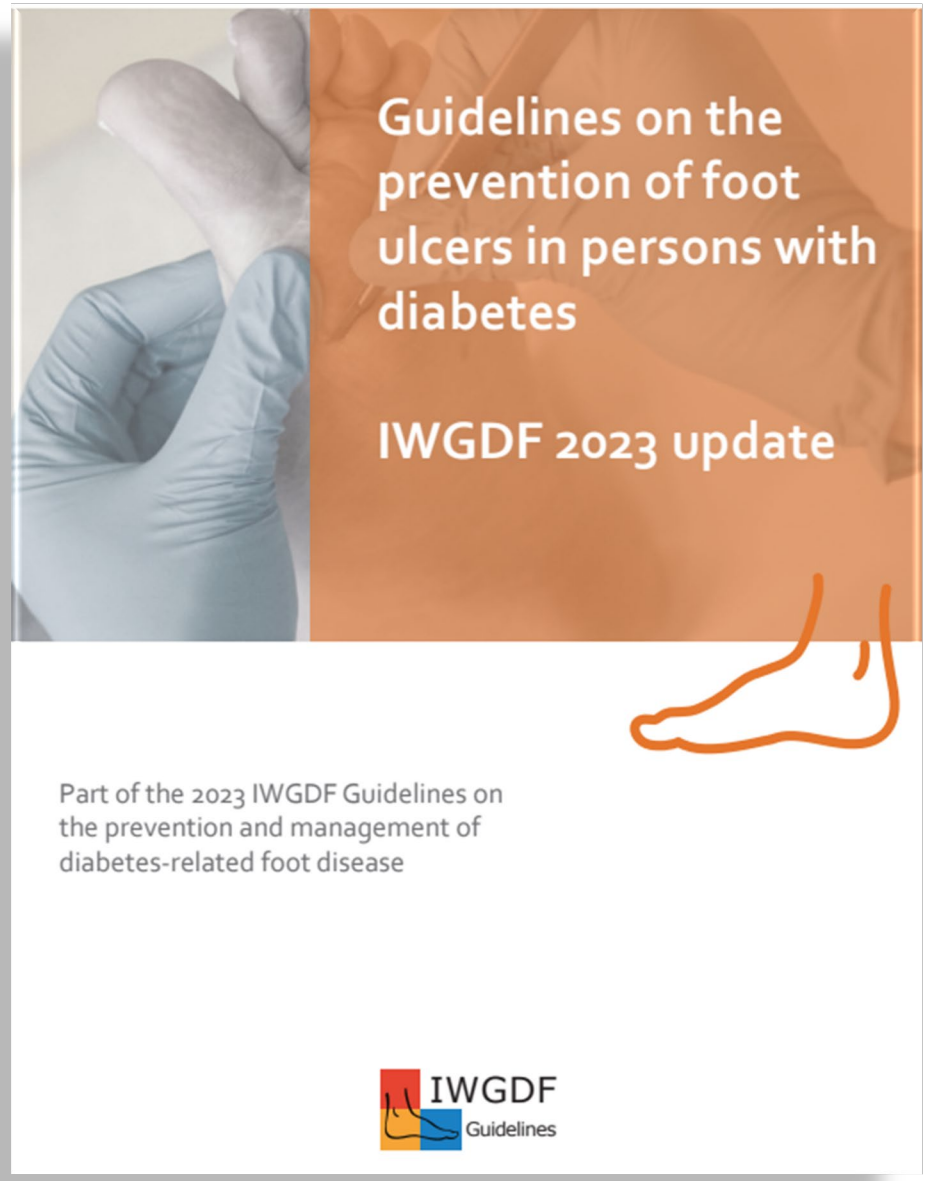


Christian Albert Theodor Billroth
(1829-1894), Chirurg

Prävention

- Identifikation von Polyneuropathie, Minderperfusion
- Diagnostik
- Regelmässige Inspektion der Füsse
- Waschen, Trocknen, Hautpflege
- Behandlung von (noch) nicht ulzerierten Pathologien

https://iwgdfguidelines.org/guidelines-2023/



Prävention

IWGDF Prevention Guideline

statistically non-significant difference in favour of the intervention (9). Education seemed more effective in the subgroups with participants at lower risk of ulceration. Given its relative low cost, ease of provision and likely trivial undesirable effects, the use of this intervention is probably favoured on balance. Therefore, education should aim to improve the person's foot care knowledge and self-care behaviour, and encourage the person to adhere to the foot self-care education provided.

Structured foot care education should consist of information on:

- Foot ulcers and their consequences
- Prevention-focused foot self-care behaviours, such as: not walking barefoot or in socks without shoes or in thin-soled slippers
- Wearing adequate protective footwear
- Undergoing regular foot checks
- Practicing proper foot hygiene; and
- Seeking professional help in a timely manner after identifying a foot problem (see recommendations 4 and 5).

https://iwgdfguidelines.org/guidelines-2023/

Zusammenfassung:

- Offene Revaskularisationsverfahren haben nachwievor einen grossen Stellenwert
- Endovaskuläre Therapien entwickeln sich stetig weiter
- Interdisziplinarität conditio sine qua non!
- Das diabetischer Fusssyndrom ist «vorbeugbar»

Take home Message:

Keine (chronische) Wunde ohne Gefässmediziner !

dafür, dass Sie Teil dieses interdiziplinären Teams sind

Gefäss-, Wund,- Pflege-, technische Orthopädie,
plastische Chirurgie…

DLT & USGG

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