

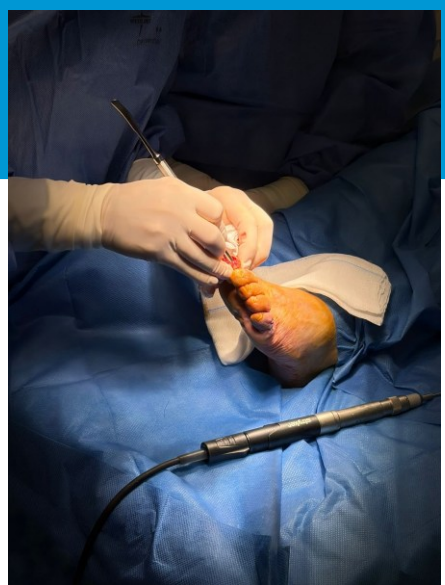
## BACKGROUND

### Clinical challenge

Ischaemia and osteomyelitis represent major challenges in the management of the diabetic foot, particularly in patients with limited distal perfusion, tissue hypoxia or no options for revascularisation. In this setting, treatment must control bone infection and achieve wound closure while preserving foot function and avoiding major amputation.

## AIM

To evaluate the **efficacy of minimally injurious surgery** in **treating bone infection** and **promoting wound healing** while **preserving foot function** in **ischaemic diabetic patients** without revascularization.



## METHODS

### Prospective observational study

**152 patients** treated between January 2022 and January 2025 using minimally injurious surgical techniques designed to control bone infection and prevent major amputation.



### Vascular assessment

- Ankle-brachial index (ABI)
- Toe-brachial index (TBI)
- Transcutaneous oxygen pressure (TcPO<sub>2</sub>)

### Ischaemia definitions

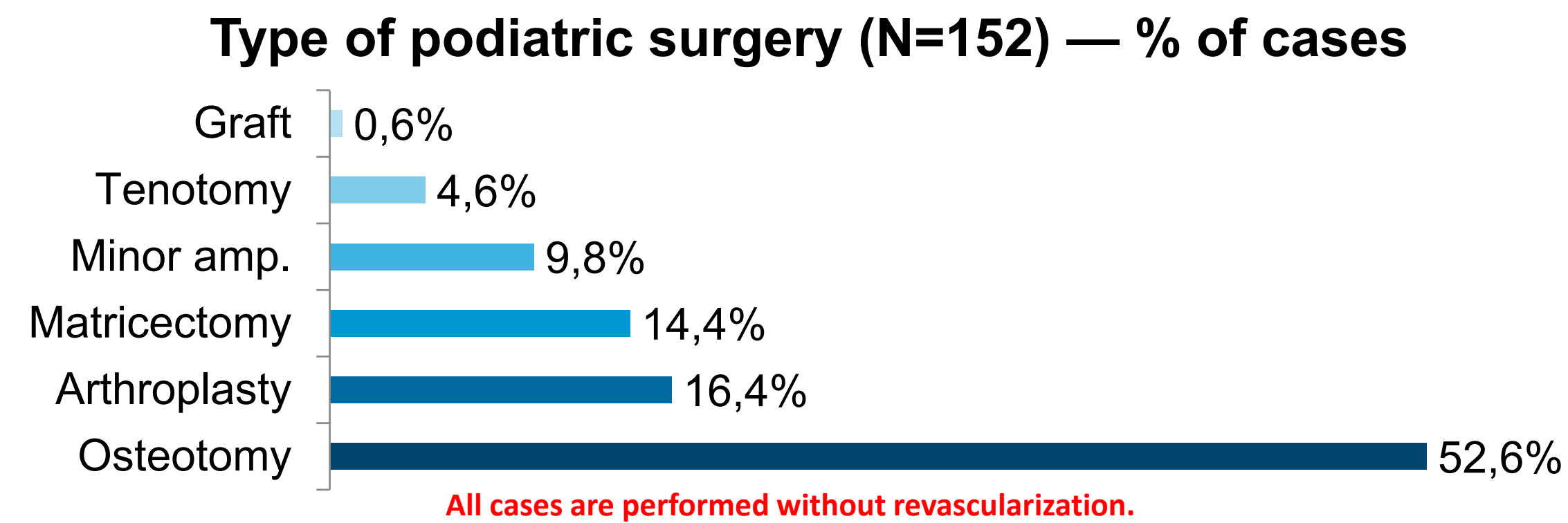
Moderate–severe: ABI < 0.59, TBI < 0.49, TcPO<sub>2</sub> < 30 mmHg

Severe: ABI < 0.39, TBI < 0.20, TcPO<sub>2</sub> < 20 mmHg

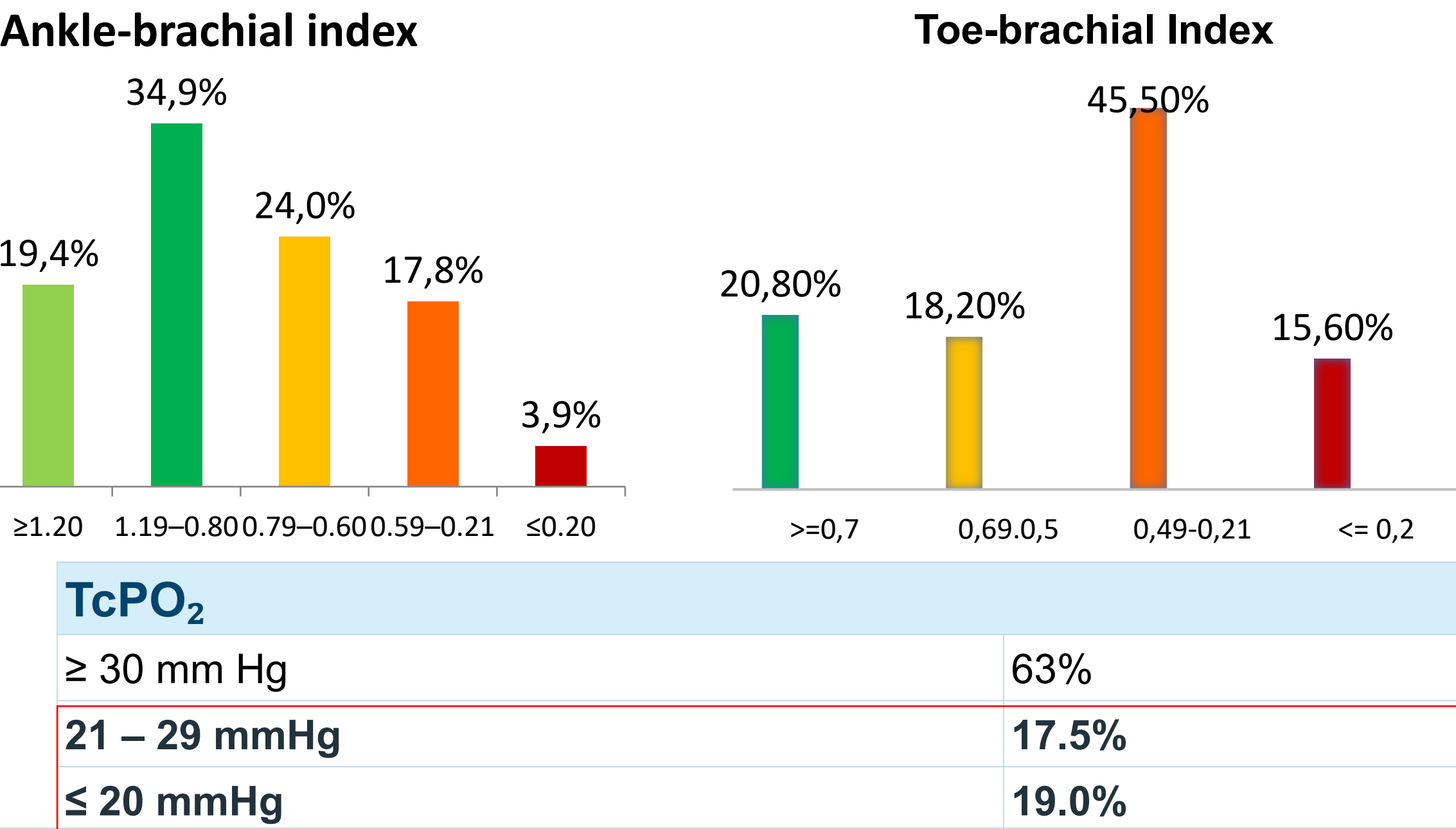
## RESULTS — STUDY POPULATION

|                         | 62.5%                   | 37.5%                       | 41.4%                |
|-------------------------|-------------------------|-----------------------------|----------------------|
|                         | Curative surgery (n=95) | Prophylactic surgery (n=57) | Ischaemic limbs (63) |
| Variable                | % (n)                   |                             |                      |
| Forefoot ulcer location | 90.1% (n=137)           |                             |                      |
| Midfoot ulcer location  | 9.9% (n=15)             |                             |                      |
| Palpable distal pulses  | 58.6% (n=89)            |                             |                      |
| Distal arterial block   | 34.2% (n=52)            |                             |                      |
| Femoropopliteal block   | 7.2% (n=11)             |                             |                      |
| Osteomyelitis           | 58.6% (n=65)            |                             |                      |
| IDSA grade 3 infection  | 57,1% (n=64)            |                             |                      |
| IDSA grade 4 infection  | 0.9% (n=1)              |                             |                      |

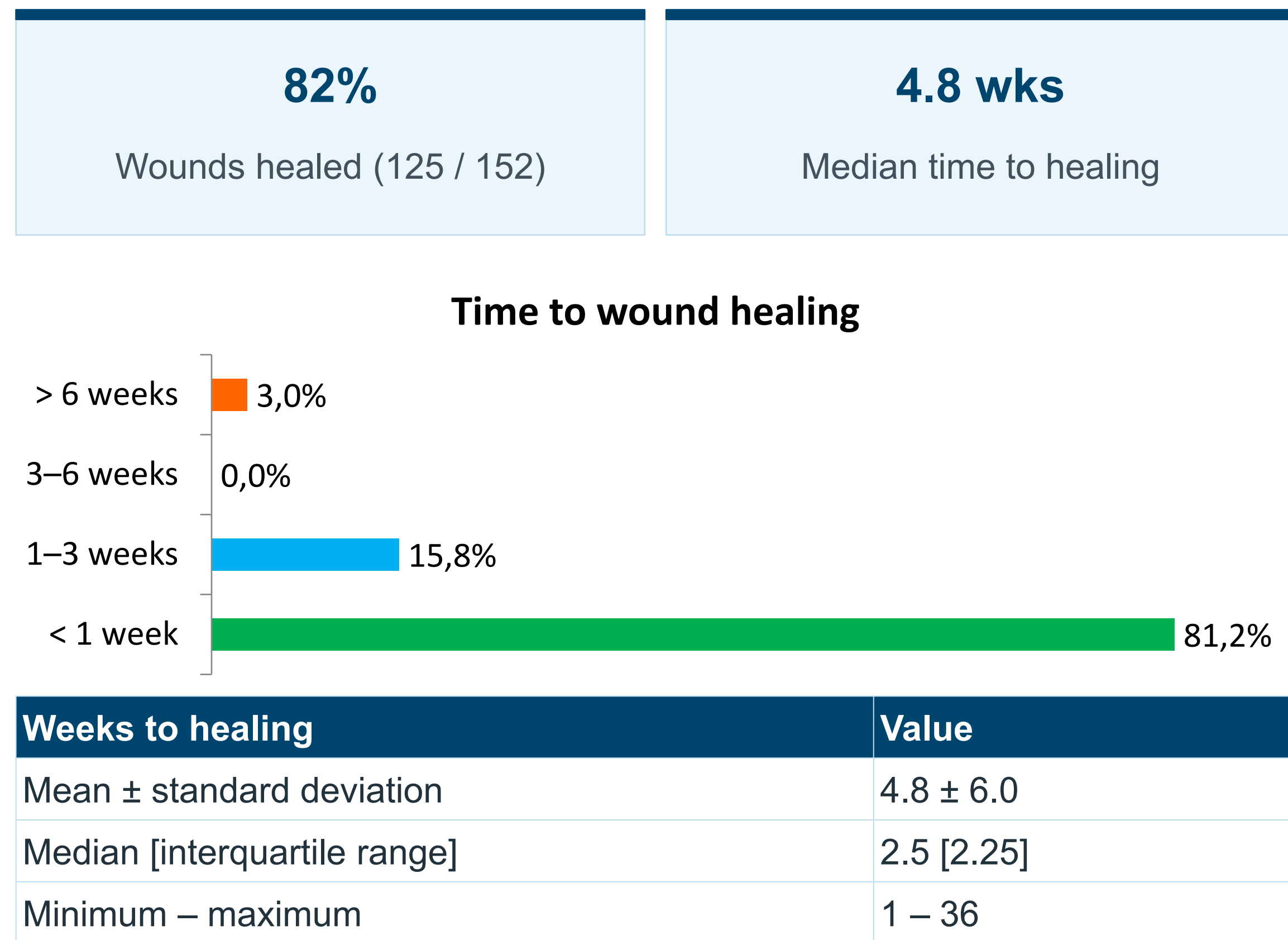
## SURGICAL PROCEDURES



## ISCHAEMIA AND PERFUSION



## RESULTS — WOUND HEALING



## REAMPUTATION, REULCERATION AND MORTALITY

| Outcome                        | % (n)        |
|--------------------------------|--------------|
| <b>REAMPUTATION</b>            |              |
| Any reamputation               | 11.3% (n=17) |
| Major reamputation             | 17.6% (n=3)  |
| Minor reamputation             | 82.4% (n=14) |
| <b>REULCERATION</b>            |              |
| Any reulceration               | 24.8% (n=34) |
| Same foot                      | 16.7% (n=23) |
| Contralateral foot             | 13% (n=18)   |
| <b>FOLLOW-UP AND MORTALITY</b> |              |
| Mean months to reulceration    | 6.9 ± 5.0    |
| Mean months of follow-up       | 15.6 ± 9.1   |
| Mortality                      | 4.8% (n=7)   |

**Only 3 major amputations occurred in the whole series.**

## OUTCOMES IN ISCHAEMIC LIMBS

| Moderate–severe ischaemia                                                  | Severe ischaemia                                     |
|----------------------------------------------------------------------------|------------------------------------------------------|
| ABI < 0.59 · TBI < 0.49 · TcPO <sub>2</sub> < 30mmHg                       | ABI < 0.39 · TBI < 0.20 · TcPO <sub>2</sub> < 20mmHg |
| <b>81% healed</b>                                                          | <b>75% healed</b>                                    |
| 63 cases · 2.4 weeks                                                       | 24 cases · 1.9 weeks                                 |
| <i>Healing remains above 75% even in the most severely ischaemic limbs</i> |                                                      |
| <b>75%</b>                                                                 | <b>89%</b>                                           |
| Ulcer-free at one year                                                     | No further surgery at one year                       |

## REPRESENTATIVE CLINICAL CASES



**Case 1· Hallux interphalangeal arthroplasty**  
ABI 0.44 (58mmHg) ·TBI 0.30 (24 mm Hg) · TcPO<sub>2</sub> 32 mmHg.  
Chronic hallux ulcer with osteomyelitis;  
Outpatient management with closure in 10 days.



**Case 2· Severe ischaemia, no revascularization options**  
TBI 0.16 (30 mm Hg) · TcPO<sub>2</sub> 16 mmHg.  
Osteomyelitis in diabetic foot (DFO)  
Ulcerectomy with resection of the phalangeal head and tenotomy  
(March 2023); complete healing by May 2023.



**Case 3 · Minimally injurious osteotomy in no option revascularization**  
Percutaneous metatarsal osteotomy (May 2025), with wound closure ( 6 months) and preserved foot function at follow-up.

## CONCLUSION

- In DFO with associated ischemia without revascularization, minimally invasive surgery is not only a therapeutic option but also an essential strategy for preserving the limb, improving quality of life, and reducing potential associated complications.
- It facilitates infection control, promotes wound closure and preserves foot function, improving long-term outcomes and quality of life.
- Combined with advanced technologies and a multidisciplinary team, it is the best evidence-based strategy for limb salvage in the diabetic foot.

**Less damage, more life**

## REFERENCES

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