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Varus osteotomy as a salvage procedure for young patients with symptomatic patellofemoral arthritis and valgus malalignment at short- to mid-term follow-up

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Conflict of interest

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Sebastian Siebenlist is a consultant for Arthrex Inc., medi GmbH & Co. KG, Medartis AG and KLS Martin Group.

The other authors have nothing to declare.

Background

- Lateral patellar facetectomy, lateral retinaculum lengthening, patellofemoral arthroplasty and **joint-preserving osteotomies**, such as an anteromedialization tibial tubercule osteotomy, are widely **accepted surgical treatment options** for **patients with symptomatic patellofemoral arthritis (PFA)** [1-8]

- **PFA** may develop secondary to osteochondral injuries, trochlear dysplasia and/or lateral patellar instability and is **most often found** on the **lateral aspect of the patellar facet** and the **corresponding area of the trochlea** [9,10]

- Risk factors include increasing age, female gender, greater BMI and **coronal malalignment** [11-14]

- **Coronal limb malalignment** is a **modifiable risk factor; alignment-correcting osteotomies** may delay PFA progression [11]

- Additionally**, following valgus correction** in case of symptoamtic patellofemoral instability, an **improvement or no progression of cartilage deterioration was observed** [15]

    - **Isolated valgus-correcting osteotomies may be a viable salvage procedure**

Purpose and hypotheses

Purpose

To report on the **clinical** and **radiological outcome** of **patients undergoing varus osteotomy** for the treatment of symptomatic PFA and associated valgus malalignment.

Hypotheses

1. Valgus-correcting osteotomy leads to a significant improvement in subjective knee function and reduction in pain at short- to mid-term follow-up.
2. An adequate correction of valgus malalignment and low complication rates may be observed.

Material and methods

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Study design	– Retrospective case series
Material	– 12 patients (13 knees) with **symptomatic PFA** and **valgus malignment** who underwent **varus osteotomy** – Surgery date: 08/2012-01/2020 – Minimum follow-up: 24 months – Patient age: < 50 years at the time of surgery – Patients who underwent patellofemoral arthroplasty were excluded

Methods	– **Radiological analysis**:
	  – change in femorotibial angle (FTA) on pre- and postoperative weight-bearing whole-leg anteroposterior radiographs
	– **Functional outcome**:
	  – Pain: VAS
	  – Function: IKDC, Kujala Score (postoperative)
	  – Sporting ability: Tegner Activity Scale
	  – Subjective satisfaction (1-10 scale)

Results

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Study population

Number of knees	12
Number of patients	14 (2 with bilateral varus osteotomy)
Sex	66.7% female
Age at the time of surgery	33.8 ± 6.6 years
Follow-up time	55.3 ± 29.3 months

Surgical procedures

Lateral open-wedge distal femoral osteotomy (DFO)	10 (71.4%)
Medial closing-wedge distal DFO	3 (21.4%)
Medial closing-wedge high tibial osteotomy	1 (7.1%)
Concomitant procedures:	
– **Lateral patellar facetectomy**	2 (14.3%)
– **Tripartite patellar fragment excision**	2 (14.3%)
– **Medialization of the tibial tubercle**	1 (7.1%)

Results

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Functional outcome

- **Significant improvement** of **knee function** and **reduction in pain**
- **Patients returned** to **preoperative sporting level**
- **High satisfaction** with **postoperative result**

PROMs	Preoperative	Follow-Up	*p* value
VAS	3.5 (2.3-5.8)	0.5 (0-2.0)	< 0.05
IKDC	56.4 ± 14.4	69.1 ± 11.2	< 0.05
Kujala Score		87.0 (62.0-92.0)	n.a.
Tegner Activity Scale	3.0 (3.0-4.0)	3.5 (3.0-4.0)	n.s.
Subjective satisfaction (1-10 scale)	n.a.	8.3 ± 1.9	n.a.

Radiological outcome

- **Significant change in FT**

  (5.0 ± 2.9° valgus to .7 ± 3.2° varus, $p < .05$)

Complications

- Two re-osteosyntheses needed; **no conversion to patellofemoral arthroplasty** or total knee arthroplasty **at follow-up**

Limitations

1. Concomitant procedures as confounding factors
2. Retrospective case series
3. Long-term results unclear

Conclusion

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- In **patients with symptomatic PFA** and **associated valgus malalignment**, **varus osteotomies** as a **salvage procedure** achieved a **significant improvement** in **knee function** and **reduction in pain**. No conversion to patellofemoral joint arthroplasty occurred. Furthermore, an adequate correction of valgus malalignment was observed.

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Thank you for your attention

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