



International Symposium
HIP OSTEOARTHRITIS
KATOWICE, 19-20 April 2018 **SAVE THE DATE**
www.poitr.pl



Static and dynamic factors affecting leg-length after THA.

Kopeć K., Kusz D., Kamiński J., Wójcik M.



Katedra i Klinika Ortopedii i Traumatologii Narządu Ruchu WLK SUM w Katowicach
Kierownik: prof. dr hab. n. med. Damian Kusz

Goals of the operative treatment

SURGEON

1. Pain control/reduction.
2. Restore function of the joint.
3. Safety – low complications rate
4. Stability of the hip.
5. Durability – low revision rate.
6. Correction of leg length discrepancy.



PATIENT

1. No pain.
2. Correction of leg length discrepancy.
3. Sexual activity.
4. Physical activity.
5. ??????????
6. ???????????

Epidemiology

- Leg length inequality affects 96% of the patients after THR (LLD 0-70 mm, avg. 2.5 mm). However only 12% report symptoms.
- Eden i Sharkey reviewed LLD among 68 patients. 32% reported symptoms (avg. 14.9mm) 68% no symptoms (avg.7.2mm).
- Sir John Charnley: „Patients with leg-length inequality up to 10mm quickly accept that and no correction is needed”.



[Am J Orthop \(Belle Mead NJ\). 1995 Apr;24\(4\):347-51.](#)
Clinical significance of leg-length inequality after total hip arthroplasty.
[Edeen J¹](#), [Sharkey PF](#), [Alexander AH](#).

Epidemiology

- Jasty – limb lengthening after THR is more common than limb shortening.
 - LLD < 5mm 75%
 - LLD 5-7mm 12,5%
 - LLD 7-10mm 2% (*Rothman Institute, Harding's direct lateral approach, supine position*).
- Limb shortening becomes symptomatic > 10mm.
- Limb lengthening becomes symptomatic > 6mm.
- 1.2% patients with leg-length equalisation after THA report lengthening of the operated extremity.
- LLD is a reason of 13.5% compensation claims in USA.



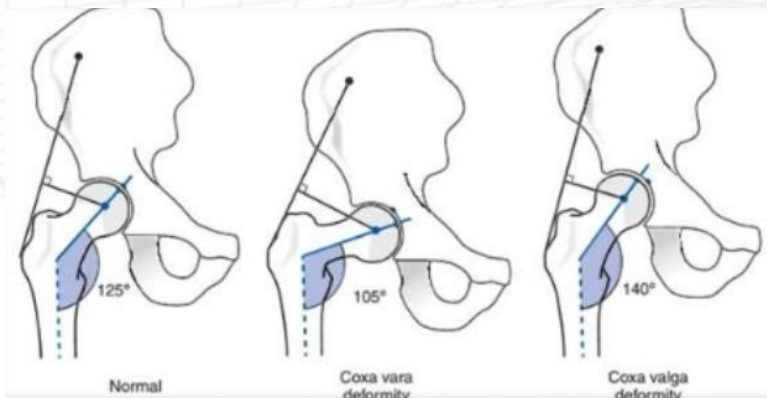
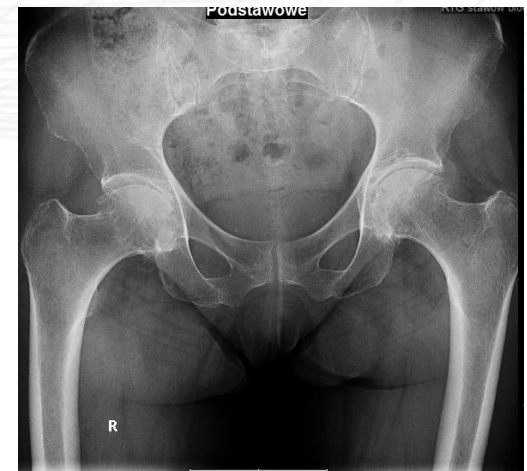
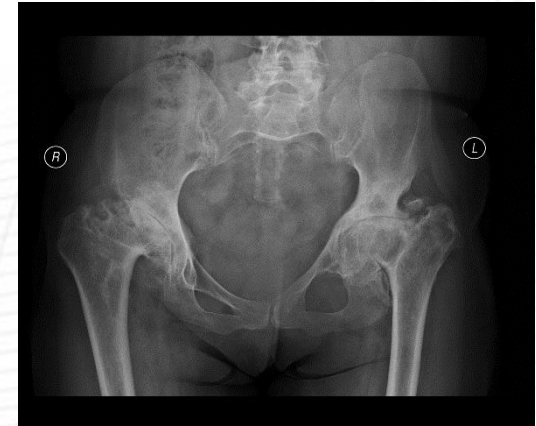
Static factors

Intraarticular:

- Etiology: DDH, SCFE, AVN, posttraumatic/postoperative arthrits
- Neck-shaft angle NSA (varus/valgus).

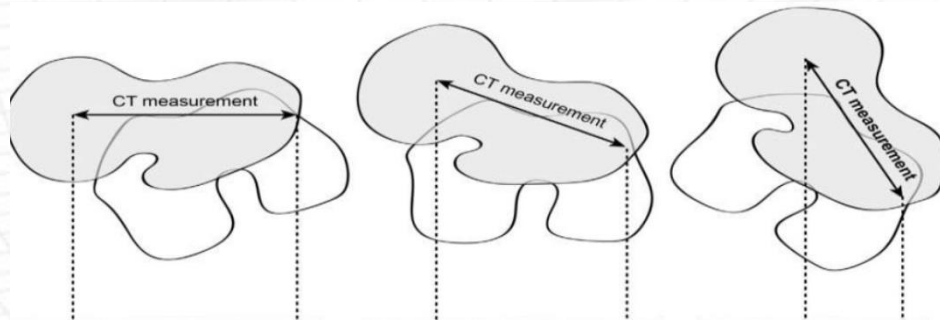
Extraarticular:

- Operative/conservative fractures treatment in the past.
- Significant knee deformity. Scoliosis. Contralateral hip arthritis.



Static factors – radiological evaluation

- Both hip joints on x-ray with marker.
- x-ray – 15deg. internal rotation.
- Preoperative planning: cup and stem positioning, osteotomy site, offset. Results in right extremity length.



Static factors – radiological evaluation

- Be prepared! Different types of implants available before skin incision.
- Surgeon should know pros and cons of available implants.



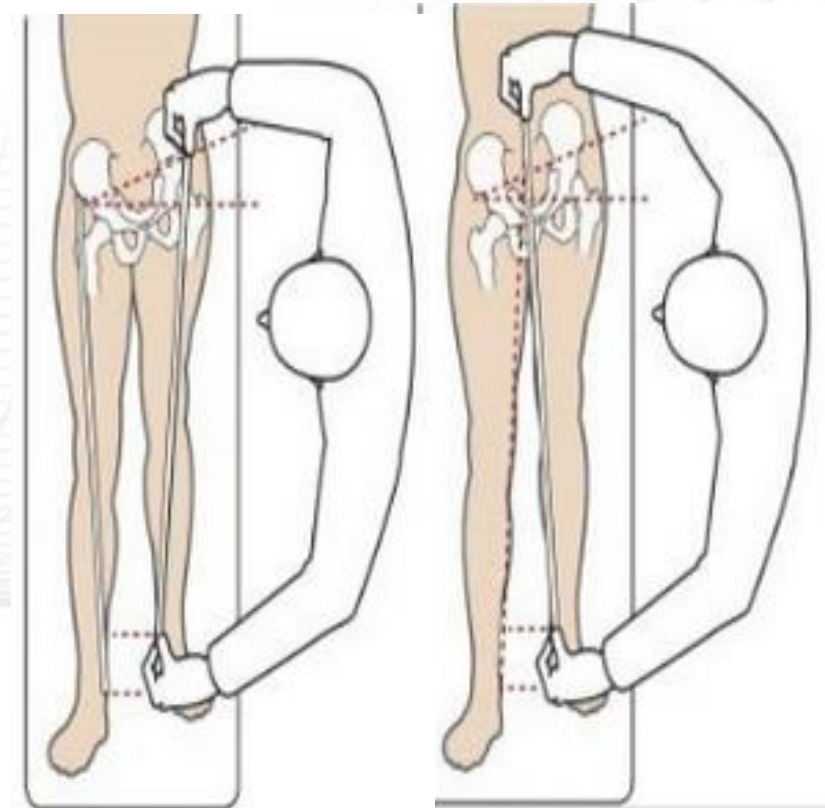
Dynamic factors – clinical evaluation

- History and physical examination.
 - Scars.
 - Contractures.
 - Neurological issues: stroke, neoplasm, cerebal palsy, polio.
 - Scoliosis.
 - Epilepsy.



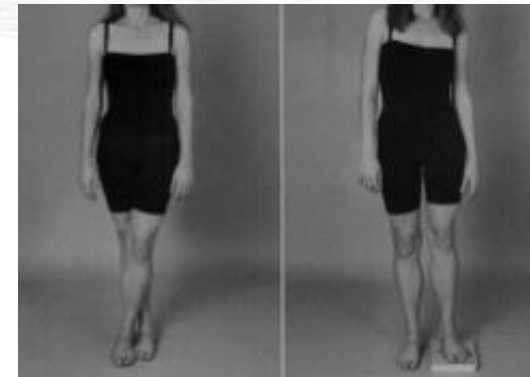
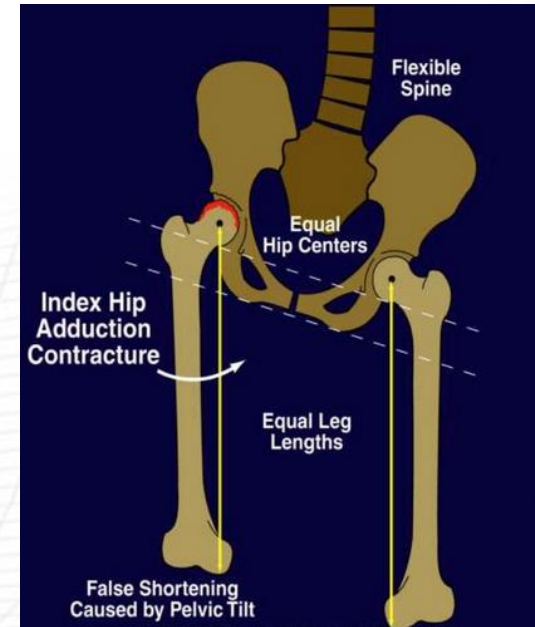
Measurements

- True LLD – when measured from ASIS to medial maleolus.
- Apparent LLD depends also on oblique pelvis (contractures) and is measured from umbiliculus to medial maleolus.
- Measuring tape can give 5mm – 10mm errors.



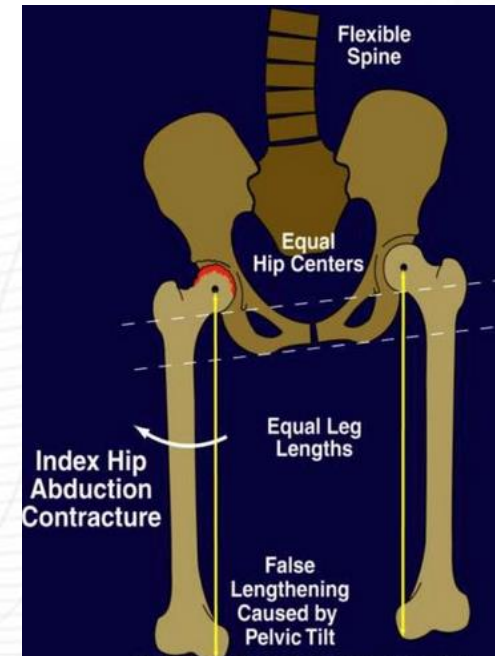
Dynamic factors – adduction contracture

- Oblique pelvis with presence of apparent LLD (short leg).
- Hip joint destruction may give impression of greater leg shortening.
- Correctable pelvis obliquity/contracture will result in good LLD correction (post-op lengthening).



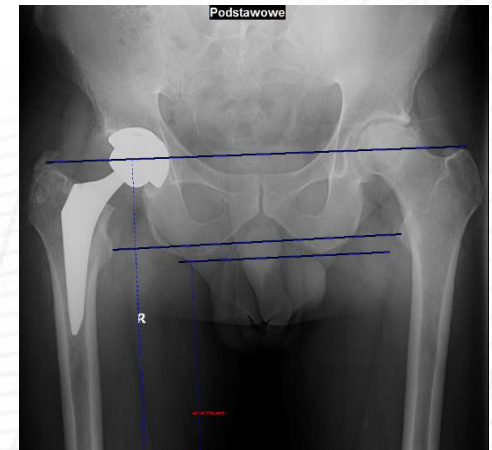
Dynamic factors – abduction contracture

- Oblique pelvis with presence of apparent LLD (long leg).
- Hip joint destruction may give impression of equal legs.
- Correctable pelvis obliquity/contracture will result in good LLD correction (post-op shortening).



Dynamic factors

- Preoperative contractures evaluation is essential.
- Non correctable oblique pelvis and scoliosis may result in apparent LLD even when the radiological measurements confirm anatomical reconstruction (unhappy patient).
- Preoperative planning must include patients perception of leg-length. Possible leghtening/shortening should be discussed before surgery.



Dynamic factors

- Block test in preoperative evaluation.
- Checks correctability of the oblique pelvis.

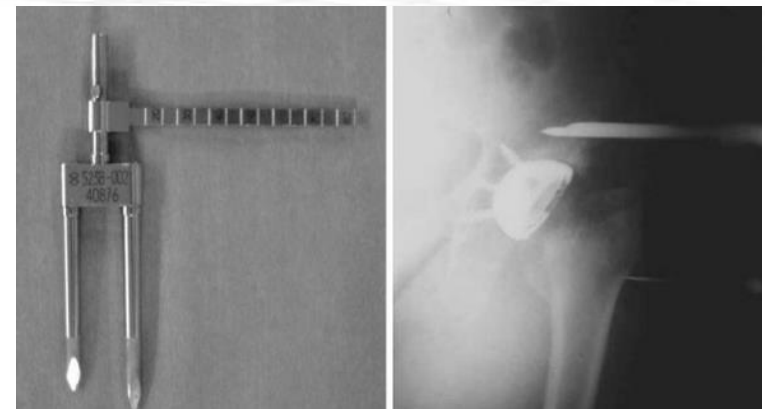
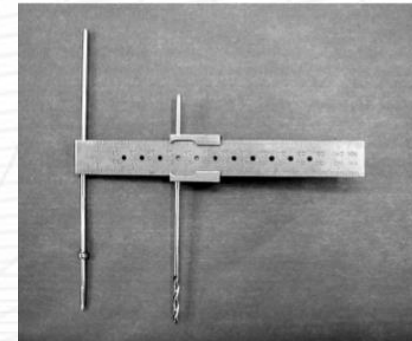


Dynamic factors

Extremity lenght	Result
Leg equalization (true and apparent LLD)	Equal extremities with well balanced pelvis
True and apparent LLD present	Unequal extremities with well balanced pelvis
True LLD absent, apparent LLD present	Non correctable oblique pelvis
True LLD present, apparent LLD absent	Unequal extremities with pelvis compensation (oblique pelvis)

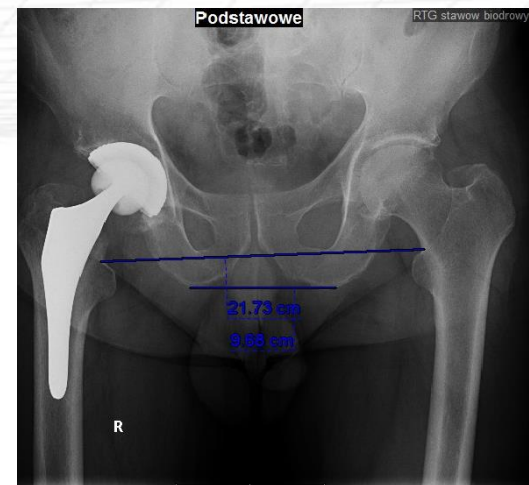
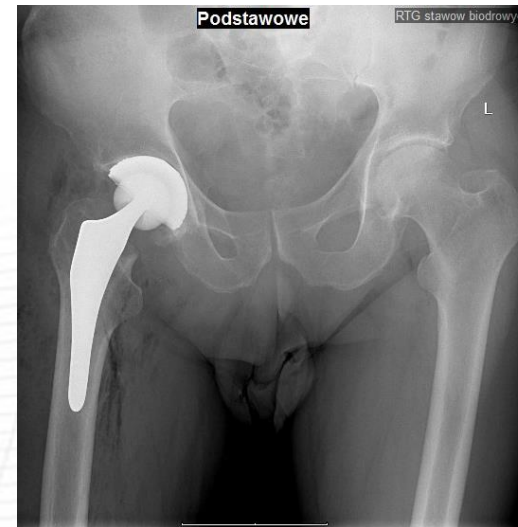
Intraoperative leg-length evaluation

- Shuck test – results depend on approach, surgeons experience, type of anaesthesia.
- Knee to knee test, foot to foot test – useful in supine position. Limbs in abduction. (5-10 deg. abduction difference will give extra 8 – 17mm).
- Intraoperative fluoroscopy.
- Measuring devices. Not accurate/user friendly enough.
- Navigation (CAS)??????



Postoperative leg-length evaluation

- Severe contractures need 3-6 months manual/kinesiotherapy before postoperative leg-length evaluation.



Conclusion

- Both static and dynamic factors affect postoperative leg-length.
- Preoperative evaluation can reduce risk of LLD after THA.
- Risk of LLD after THA can be reduced but still cannot be ruled out and both surgeon and patient should be aware of that.



International Symposium HIP OSTEOARTHRITIS

KATOWICE, 19-20 April 2018 **SAVE THE DATE**

www.poitr.pl



Międzynarodowy Portal Medyczny

Thank you!

Kopeć K., Kusz D., Kamiński J., Wójcik M.



Katedra i Klinika Ortopedii i Traumatologii Narządu Ruchu WLK SUM w Katowicach
Kierownik: prof. dr hab. med. Damian Kusz