Blount’s Disease
Langenskiold Classification
Neil Price
Langenskiold Classification

Acta Orth Scand. 1954
JBJS 46A 1964

• Age and severity of deformity as grading parameters

• Six stage radiographic classification of infantile tibia vara

• Based on changes observed as child matured
Langenskiold’s Classification

I

II

III

IV

V

VI

NOT BEFORE ONE YEAR

NOT BEFORE 9 YEARS
Stage I (2 - 3 years of age)

- Irregularity of metaphyseal ossification zone
- Delayed development of medial portion of epiphysis
- Medial metaphysis beaked medially & distally
Stage II (2.5 - 4 years of age)

- Sharp depression of physeal line medially
- Medial beaking
- Medial part of epiphysis more wedge shaped and underdeveloped
Langenskiold’s Classification
Stage III (4 - 6 years of age)

- Deepening depression of metaphyseal beak
- Appearance of "step" in metaphysis
- Increasing wedging & underdevelopment of epiphysis
Stage IV (5 - 10 years of age)

- Physis narrows
- Epiphysis enlarges
- Increasing depth of “step” in metaphysis
- Epiphysis occupies depression in medial metaphysis
Langenskiold’s Classification
Stage V (9 - 11 years of age)

- Bony epiphysis separated into 2 portions by clear band
- "Partially double epiphyseal plate"
- Slope to medial articular surface
Stage VI (10 - 13 years of age)

- Branches of medial part of physis ossify - medial growth arrest

- Normal growth of lateral part
Langenskiold’s Classification

I II III IV V VI

NOT BEFORE ONE YEAR

NOT BEFORE 9 YEARS
Langenskiold Classification

• Originally thought that up to Stage IV osteotomy would restore normality

"early osteotomy, adequately performed before the age of eight years ordinarily results in a cure"
Langenskiold Classification

- Overly optimistic - Loder & Johnson JPO 1987
  Patients presenting with stage II or III may progress despite adequate correction
  May be due to population differences

- Langenskiold admitted that stages do not coincide with prognosis & results of treatment (CORR 1989)
Langenskiold Classification

Reliability
Younger child difficult to differentiate Stage I from physiological bow leg

Interobserver Reliability
Better for early & late grades
Poor for middle grades
Medial Physeal Slope

Kling et al. 1990

- Angle at intersection of lines through lateral aspect of tibial physis & medial physis
  - Angle $> 60^0$ always associated with recurrent varus deformity after tibial osteotomy alone
Medial physeal slope
Medial Physeal Slope

- Large slopes correlate with higher Langenskiold stage
- Medial physeal slope more objective measurement