

TABLE E-1 Case Histories and Description of Deformity Characteristics

Case	Clinical Scenario	Coronal Plane Angulation	Sagittal Plane Angulation	Axial Plane Angulation: Rotational Deformity	Coronal Plane Translation	Sagittal Plane Translation	Axial Plane Translation: Shortening/Lengthening
1	Fifty-four-year-old man with a history of closed tibial fracture three years previously, treated nonoperatively. Patient worked as laborer but was unable to continue working secondary to knee and ankle pain. Patient wanted attempt at surgical correction. At latest follow-up (thirteen months), he was working, but not as a laborer, and continued to have moderate knee pain, but felt improvement from the preoperative status.	12° varus	None	None	None	1 cm posterior	None
2	Fifty-seven-year-old woman with psychiatric history who had sustained a closed tibial fracture six months before sustaining an acute fracture of the same tibia. Although she had minimal deformity, the acute fracture proximal to the valgus angulation (2°) and lateral translation (40%) prevented intramedullary nailing of the acute, displaced fracture; therefore, the clamshell osteotomy was performed. At final follow-up (eighteen months), she was fully weight-bearing and had	2° valgus	None	None	1.5 cm lateral translation	None	None

	returned to her previous level of function. She complained of knee pain before and after the clamshell osteotomy.						
3	Eighteen-year-old male competitive collegiate baseball player who had difficulty pitching a full game secondary to pain and lack of endurance. He stated he was unable to “push off” correctly because of the deformity. The fracture was treated nonoperatively seven months prior to surgery. He wanted deformity correction to relieve pain and to help his pitching. Six months later, he returned to collegiate baseball pitching and stated that the pain had completely resolved. He was followed for thirteen months, with no change in symptoms.	13° varus	2° apex posterior	None	None	None	None
4	Fifty-two-year-old man who had sustained femoral shaft and segmental tibial fractures in a motor-vehicle collision at the age of twenty years. Patient was managed nonoperatively with traction and casting. Worked as a manual laborer and reported more difficulty accomplishing projects because	6° varus	2° apex posterior	25° internal rotation	1.7 cm medial	None	0.5 cm short

	of increasing knee pain. Pain was localized mainly to medial joint line. Patient had deviation of mechanical axis secondary to previous healing in nonanatomic position.						
5	Forty-eight-year-old man who had sustained a femoral fracture playing football thirty years previously. Managed with skeletal traction followed by spica cast. Had development of medial knee pain, early leg fatigue with activity, and difficulty walking. Failed intra-articular injections and knee arthroscopy.	12° varus	None	10° external rotation	None	2 cm posterior	2.5 cm short
6	Twenty-eight-year-old man who had sustained femoral fracture sixteen years previously. Managed with skeletal traction and casting. Manual laborer. Had development of increasing activity-related pain in knee and lower back and an antalgic gait. Had failure of conservative management with nonsteroidal anti-inflammatory drugs and attempted orthotic leg-length equalization.	12° varus	13° apex anterior	20° external rotation	None	None	5 cm short

7	<p>Seventy-one-year-old man who presented to emergency department secondary to fall with acute onset of severe leg pain. Diagnosed with subtrochanteric femoral fracture proximal to a long-standing femoral malunion. Patient reported having sustained a femoral fracture over thirty years previously; fracture had been treated with skeletal traction and casting. He had been experiencing difficulty walking with a stooped gait prior to the subtrochanteric femoral fracture. It was thought that it would be exceedingly difficult and less than ideal to treat the subtrochanteric fracture without treating the pre-existing deformity.</p>	18° varus	32° apex posterior	Unknown secondary to acute fracture			
8	<p>Thirty-three-year-old man who initially had sustained a Gustilo type-IIIa open segmental tibial fracture in a work-related motor-vehicle collision approximately one year before presentation (treated elsewhere). Underwent multiple débridements and external fixator placement. Had development of recalcitrant pin-track infections, which led to removal of external fixator</p>	10° varus	None	5° internal rotation	None	5 cm posterior	1 cm short

	prior to healing. Had development of malunion. Complained of chronic leg pain, an antalgic gait, joint line pain, and the inability to work.						
9	Fourteen-year-old girl who had sustained a Gustilo type-III A open tibial fracture that was initially treated with irrigation and débridement and external fixation. Had development of recalcitrant pin-track infections, which led to removal of external fixator prior to healing. Had development of malunion.	14° varus	None	None	None	1.7 cm posterior	1.5 cm short
10	Fifty-five-year-old woman who had sustained a gunshot wound to the femur over twenty years previously, which was treated with skeletal traction and casting. Had development of increasing medial joint line pain after varus deformity, which was unresponsive to conservative treatment.	20° varus	None	None	None	2 cm posterior	None