

## Supplementary article data

# Risk factors for aseptic loosening of Müller-type straight stems

## A registry-based analysis of 828 consecutive cases with a minimum follow-up of 16 years

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### Supplementary data

Table 2. Technical details of the 4 stems investigated

	MSS Co	MSS Ti	SL Ti	SL Co
Material specification	ISO 5832-6	ISO 5832-11	ISO 5832-11	ISO 5832-6
Modulus of elasticity	220 GPa	110 GPa	110 GPa	220 GPa
Surface finish	homogenous blasted		proximal third rough-blasted, distal two-thirds blasted	
Surface roughness ( $R_a$ ), $\mu\text{m}$	0.5–1.5	1–2	proximal 3–5, distal 0.5–1.5	proximal 4–6, distal 0.5–1.5

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Table 5. Crude and adjusted risk ratios (RRs) for aseptic loosening of Müller-type straight stems

Covariates	n		Aseptic loosening		Crude RR (95% CI)		Adjusted RR (95% CI)	
	n	%	n	%		p-value		p-value
Design								
SL	389	47	84	22	2.2 (1.6–3.1)	< 0.001	1.5 (1.1–2.3)	0.03
MSS	439	53	55	13	ref. group		ref. group	
Material								
Ti	500	60	114	23	3.6 (2.3–5.5)	< 0.001	3.2 (2–5)	< 0.001
Co	328	40	25	8	ref. group		ref. group	
Age								
< 50 years	28	3	8	29	3.1 (1.3–7.3)	0.01	3.9 (1.6–9.3)	0.002
50–59 years	113	14	33	29	3.1 (1.7–5.7)	< 0.001	2.9 (1.5–5.3)	0.001
60–75 years	454	55	83	18	2.0 (1.2–3.5)	0.01	2.1 (1.2–3.7)	0.009
> 75 years	233	28	15	6	ref. group		ref. group	
Sex								
male	485	59	106	22	2.7 (1.8–3.9)	< 0.001	3.0 (2–4.5)	< 0.001
female	343	41	33	10	ref. group		ref. group	
Diagnosis								
others	43	5	6	14	0.8 (0.4–1.9)	0.6		
IA	30	4	1	3	0.2 (0–1.4)	0.1		
Fx	55	7	3	6	0.4 (0.1–1.1)	0.08		
OA	700	85	129	18	ref. group			
Offset								
SL stem	389	47	84	22	3.5 (2–6.2)	< 0.001		
MSS lateral	250	30	40	16	2.1 (1.1–3.7)	0.02		
MSS standard	189	23	15	8	ref. group			
Stem size								
7.5	131	16	34	26	4.5 (1.9–10.8)	0.001	4.5 (1.8–11)	0.001
10	355	43	71	20	3.0 (1.3–6.9)	0.01	2.4 (1–5.6)	0.04
12.5	253	31	28	11	1.7 (0.7–4)	0.3	1.5 (0.6–3.6)	0.4
≥ 15	89	11	6	7	ref. group		ref. group	
Cup								
cementless	500	60	116	23	4.1 (2.6–6.4)	< 0.001	2.4 (1.4–3.9)	0.001
cemented	328	40	23	7	ref. group		ref. group	
Head size								
28 mm	563	68	118	21	3.5 (2.1–5.6)	< 0.001		
32 mm	265	32	21	8	ref. group			

n represents number of stems.

OA; osteoarthritis; IA: inflammatory arthritis; Fx: fracture.