No Difference in Revision Rate between low Viscosity and high Viscosity Cement used in primary Total Knee Arthroplasty

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INTRODUCTION:

Loosening remains one of the most common reasons for revision total knee arthroplasty (TKA). Cement viscosity has a potential role in reducing revision rates for loosening. The aim of this study was to assess the outcome for loosening of the 5 most used cemented knee prostheses by constraint type, based on the cement viscosity type used.

METHODS:

There were 214,708 TKA procedures performed between 1999 and 2020 for a diagnosis of osteoarthritis using the 5 most commonly used minimally stabilized, posterior stabilized and medial pivot design cemented tibial components. Only procedures with a cemented tibial component were included. Outcomes for two different cement viscosities, 140,060 high viscosity and 74,648 low viscosity cement were compared for each fixation type within each of the three stability types.

RESULTS:

There was no difference in risk of all-cause revision when high viscosity cement was compared to low viscosity cement for minimally stabilized prostheses (HR 1.07 [95% CI 0.99-1.15], p=0.09), Fig. 1, posterior stabilized prostheses (HR 1.03 [95% CI 0.95-1.11], p=0.53), Fig. 2 and medial pivot design prostheses (HR 1.06 [95% CI 0.80-1.41], p=0.67), Fig. 3. No difference was observed between cement viscosity type for any of the prosthesis constraint types when aseptic loosening was assessed.

DISCUSSION AND CONCLUSION:

We found no difference in the risk of revision for any reason, or for loosening, with cement viscosity for the most commonly used minimally stabilized, posterior stabilized and medial pivot total knee arthroplasty. The role of cement viscosity in the risk of TKA revision remains unclear and further research is required.
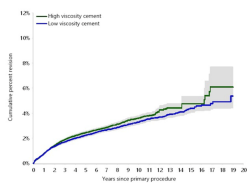

Fig. 1

Fig. 2

Fig. 3

Number at risk	0 year	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years
High viscosity cement	71,925	64,817	56,359	47,113	38,119	30,091	23,825	18,375	13,906	10,000	7110
Low viscosity cement	51,412	48,093	43,737	38,816	34,362	29,893	25,704	21,865	18,232	14,616	11,401
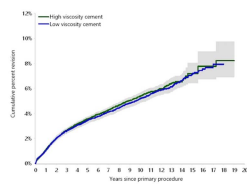
Number at risk	11 years	12 years	13 years	14 years	15 years	16 years	17 years	18 years	19 years	20 years
High viscosity cement	4576	2759	1507	848	342	297	258	204	79	14
Low viscosity cement	8787	6592	4825	3328	2036	1178	694	417	175	11

Number at risk	0 year	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years
High viscosity cement	51,635	47,792	43,324	38,406	33,257	27,599	22,430	17,904	14,304	11,051	7868
Low viscosity cement	21,152	20,536	19,796	18,856	17,567	16,132	14,708	13,316	11,755	10,106	8472
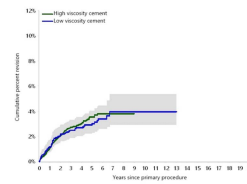
Number at risk	11 years	12 years	13 years	14 years	15 years	16 years	17 years	18 years	19 years	20 years
High viscosity cement	5412	3516	2024	824	353	284	227	138	46	12
Low viscosity cement	6758	5190	3753	2586	1608	837	347	67	16	2

Number at risk	0 year	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years
High viscosity cement	16,500	12,356	8772	5829	3445	1516	619	296	119	66	25
Low viscosity cement	2084	1907	1698	1531	1318	985	509	254	196	135	79

Number at risk	11 years	12 years	13 years	14 years	15 years	16 years	17 years	18 years	19 years	20 years
High viscosity cement	5	3	1	0	0	0	0	0	0	0
Low viscosity cement	58	45	42	33	27	13	10	8	4	0