

In Brief

Total Hip Arthroplasty in Hemophilic Patients: are their Results Similar to those of Nonhemophilic Patients?

E. Carlos Rodriguez-Merchan, MD, PhD

Research performed at Department of Orthopedic Surgery, La Paz University Hospital-IdiPaz, Madrid, Spain

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Abstract

Total hip arthroplasty (THA) is the mainstay therapy for patients with terminal hemophilic arthropathy of the hip. However, the largest case series published between 2017 and 2023 in the literature on THA in patients with hemophilia have found a higher 1-year infection rate (8.1% versus 3.4%) in hemophilia patients than in the general population, a higher rate of in-hospital bleeding complications (38.7% versus 16.1%), a higher length of stay (6 days versus 3 days) and a higher 30-day readmission rate (22.6% versus 4.1%). Finally, a lower 5-year survival rate has also been observed in hemophilia patients than in the general population (91.9% versus 95.3%). In the last decade there have been dramatically positive improvements in implant designs and hematological treatment, and therefore it does not seem that THA in hemophilia is so far from that in osteoarthritic patients.

Level of evidence: III**Keywords:** Complications, Hemophilia, Implant survival, Results, Total hip arthroplasty**Introduction**

Total hip arthroplasty (THA) is the mainstay therapy for patients with terminal hemophilic arthropathy of the hip.^{1,2} The aim of this article is to analyze what the literature published during the last seven years (2017-2023) says regarding THA in hemophilia. On 13 December 2023 a literature search was performed in PubMed using "hemophilia total hip arthroplasty" as keywords. One hundred and forty-three articles were found, of which 5 were finally analyzed because they were all case series published between 2017 and 2023 on THA in hemophilia (inclusion criteria). The other 138 articles were excluded because they did not meet the aforementioned inclusion criteria.

Main body**Data from the literature**

[Table 1] summarizes case series published between 2017 and 2023 on THA in patients with hemophilia.³⁻⁷ [Figure 1] shows the comparative rates of various parameters studied in the literature on THA in hemophilic patients versus

nonhemophilic patients.⁸⁻¹⁴**Conclusion**

It appears that, contrary to knee and ankle arthroscopic synovectomy or radiosynovectomy, preventative measures are not taken in hip hemophilic arthropathy. This may play a role in the rapid progression of joint deterioration, although the prevalence of bleeding in the hip is not as significant as in the knee or ankle. The largest case series in the literature on THA in patients with hemophilia have found a higher 1-year infection rate (8.1% versus 3.4%) in hemophilia patients than in the general population, a higher rate of in-hospital bleeding complications (38.7% versus 16.1%), a higher length of stay (LOS) (6 days versus 3 days), and a higher 30-day readmission rate (22.6% versus 4.1%). Finally, a lower 5-year survival rate has also been observed in hemophilia patients than in the general population (91.9% versus 95.3%).

Corresponding Author: E. Carlos Rodriguez-Merchan, Department of Orthopedic Surgery, La Paz University Hospital-IdiPaz, Madrid, Spain

Email: ecrmerchan@hotmail.comTHE ONLINE VERSION OF THIS ARTICLE
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In the last decade there have been dramatically positive improvements in prosthetic designs and hematological

treatment, and therefore it does not seem that THA in hemophilia is so far from that in osteoarthritic patients.

Table 1. Main case series published between 2017 and 2023 on total hip arthroplasty (THA) in patients with hemophilia

AUTHORS [REFERENCE] / YEAR OF PUBLICATION	NUMBER OF PATIENTS / NUMBER OF THAs	IMPLANT SURVIVAL	AGE (AVERAGE / RANGE) - YEARS	FOLLOW-UP (AVERAGE / RANGE)	RESULTS / COMPLICATIONS	CONCLUSIONS
Strauss et al [3] 2017	43 / 49	90%	NA	11.5 years range, 3-32	Three (6.1%) periprosthetic infections and five (10.2%) aseptic implant loosening happened following THA leading to revision arthroplasty. In two (4.1%) individuals, a pseudotumor and one (2%) periarticular ossification had to be resected after THA.	THA led to a substantial increase of function, reduction of pain and a high satisfaction. Due to the relatively high complication rate, an individual evaluation of the risk-benefit ratio from surgical and hematological point of view is required.
Wu et al [4] 2017	21 / 24	100%	30 range, 15-49	9.4 years range, 5-15	No signs of loosening, infection or other adverse events of the implant components were found during the regular clinical and radiological evaluations. One patient suffered a proximal femoral fracture intraoperatively, which was managed successfully with cerclage cables, and the patient accomplished bone union at 3 months after the surgery. Another patient developed deep vein thrombosis 13 days after surgery. Anticoagulation with therapeutic doses of low-molecular-weight heparin was administered for 11 days, and the problem resolved 24 days postoperatively.	THA in patients with hemophilia led to substantial improvement in joint function with a relatively low rate of adverse events. Increased blood loss and substitution therapy had negative influences on the mid-run to long-run outcomes of THA.
Wang et al [5] 2019	121 / NA A comparison was made between hemophilia patients and 194,026 patients without hemophilia. Patients with TKA were included.	NA	NA	NA	Patients with hemophilia had longer LOS compared to patients without hemophilia. Hemophiliacs had a higher yet nonsignificant 1-year infection rate (8.11% vs 3.38%) after THA. There were no differences between the rates of 30-day and 90-day complications, 1-year infection, reoperation and mortality between the hemophilia and nonhemophilia groups.	Hemophilia patients have higher rates of postoperative transfusion and increased LOS. There was an appreciable clinical difference in 1-year infection rates following THA. Other postoperative adverse events and mortality rates were comparable. Patients with hemophilia should be counseled that infection rate maybe as high as 8% following THA.
Chiasakul et al [6] 2020	118 / NA A comparison was made between hemophilia patients and 3,811 patients without hemophilia. Patients with TKA were included.	NA	57 range, NA	30 days	Compared with controls, patients with hemophilia had a higher risk of bleeding complications after hip procedures (38.7% versus 16.1%), longer median LOS after hip (6 versus 3 days) and higher rates of unplanned 30-day readmission after hip (22.6% versus 4.1%) procedures. The most common reason for unplanned 30-day readmission in patients with hemophilia was bleeding or the patient's underlying coagulopathy (25.1%).	Patients with hemophilia undergoing hip arthroplasty had a higher incidence of postoperative bleeding (hip procedures), longer LOS, and higher rates of unplanned 30-day readmission compared with nonhemophilic controls.

Table 1. Continued

Gillinov et al [7] 2022	518 / NA A comparison was made between hemophilia patients and 5,193 non-hemophilia patients.	Five-year implant survival was significantly lower in the hemophilia cohort relative to the control cohort (91.9% vs. 95.3%)	62.8 range, 51.2-74.4	90 days	Hemophilia patients had greater odds of aggregated serious adverse events, mild adverse events and any adverse events. Patients with hemophilia had greater odds of bleeding issues (transfusion and hematoma), venous thromboembolism (deep vein thrombosis and pulmonary embolism), and acute kidney injury.	Hemophilia patients undergoing THA had elevated risks of both 90-day bleeding complications and venous thromboembolism relative to matched controls.
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NA, not available; LOS, length of stay

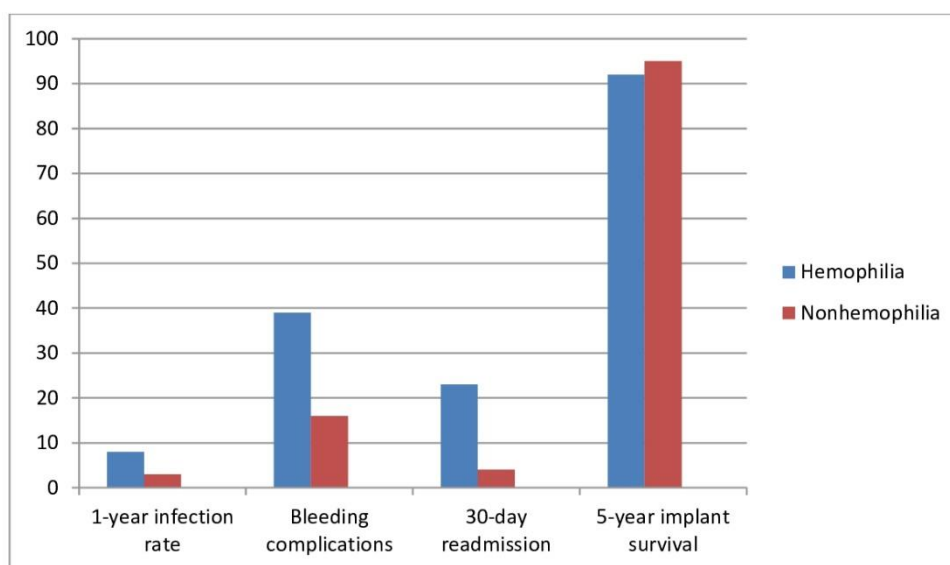


Figure 1. Comparative rates of various parameters studied in the literature on total hip arthroplasty (THA) in hemophilia

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1 Department of Orthopedic Surgery, La Paz University Hospital-IdiPaz, Madrid, Spain

References

- Carulli C, Felici I, Martini C, et al. Total hip arthroplasty in haemophilic patients with modern cementless implants. *J Arthroplasty*. 2015; 30(10):1757-1760. doi: 10.1016/j.arth.2015.04.035.
- Mortazavi SJ, Daneshpoor SMM, Shafiei SH. Total hip arthroplasty in patients with hemophilia: what do we know? *Arch Bone Jt Surg*. 2023; 11(7):434-440. doi: 10.22038/ABJS.2023.58812.291.
- Strauss AC, Rommelspacher Y, Nouri B, et al. Long-term outcome of total hip arthroplasty in patients with haemophilia. *Haemophilia*. 2017; 23(1):129-134. doi: 10.1111/hae.13045.
- Wu GL, Zhai JL, Feng B, Bian YY, Xu C, Weng XS. Total hip arthroplasty in hemophilia patients: a mid-term to long-term follow-up. *Orthop Surg*. 2017; 9(4):359-364. doi: 10.1111/os.12354.
- Wang SH, Chung CH, Chen YC, Cooper AM, Chien WC, Pan RY. Does hemophilia increase risk of adverse outcomes following total hip and knee arthroplasty? A propensity score-matched analysis of a nationwide, population-based study. *J Arthroplasty* 2019; 34(10):2329-2336.e1. doi: 10.1016/j.arth.2019.05.062.
- Chiasakul T, Buckner TW, Li M, Vega R, Gimotty PA, Cuker A. In-hospital complications and readmission in patients with hemophilia undergoing hip or knee arthroplasty. *JB JS Open Access* 2020; 5(2):e0085. doi: 10.2106/JBJS.OA.19.00085.
- Gillinov SM, Burroughs PJ, Moore HG, Rubin LE, Frumberg DB, Grauer JN. Total hip arthroplasty in patients with classic

- hemophilia: a matched comparison of 90-day outcomes and 5-year implant survival. *J Arthroplasty*. 2022; 37(7):1333-1337. doi: 10.1016/j.arth.2022.02.107.
8. Hernandez N, Kim B, Cochrane NH, Ryan SP, Seyler TM. Midterm results of contemporary uncemented total hip arthroplasty in patients 45 years or younger. *Orthopedics*. 2023; 46(1):e45-e51. doi: 10.3928/01477447-20221024-04.
9. Fransen BL, Bengoa FJ, Neufeld ME, Sheridan GA, Garbuz DS, Howard LC. Thin highly cross-linked polyethylene liners combined with large femoral heads in primary total hip arthroplasty show excellent survival and low wear rates at a mean follow-up of 12.8 years. *Bone Joint J*. 2023; 105-B(1):29-34. doi: 10.1302/0301-620X.105B1.BJJ-2022-0812.R1.
10. Chen AG, Sogbein OA, McClure JA, et al. Total hip arthroplasty in patients aged 40 to 60 years old: a population-based study. *J Arthroplasty*. 2023; 38(7S):S83-S88.e2. doi: 10.1016/j.arth.2023.04.027.
11. Wooster BM, Kennedy NI, Dugdale EM, et al. Contemporary outcomes of primary total hip arthroplasty in patients with inflammatory arthritis. *Bone Joint J*. 2023; 105-B (7):768-774. doi: 10.1302/0301-620X.105B7.BJJ-2023-0220.R1.
12. Parilla FW, Youngman TR, Layon DR, et al. Excellent 20-year results of total hip arthroplasty with highly cross-linked polyethylene on cobalt-chromium femoral heads in patient's ≤50 years. *J Arthroplasty*. 2024; 39(2):409-415. doi: 10.1016/j.arth.2023.08.025.
13. Parilla FW, Anthony CA, Bartosiak K, Pashos GE, Thapa S, Clohisy JC. Ten year outcomes of contemporary total hip arthroplasty in adolescent and young adult patients are favorable. *J Arthroplasty*. 2024; 39(3):754-759. doi: 10.1016/j.arth.2023.09.032.
14. Ennis HE, Lamar KT, Johnson RM, Phillips JL, Jennings JM. Comparison of outcomes in high versus low activity level patients after total joint arthroplasty. *J Arthroplasty*. 2024; 39(1):54-59. doi: 10.1016/j.arth.2023.06.031.