Microbiologic Composition and Failure Rates of Prosthetic Hip and Knee Infections Managed With Debridement, Antibiotics, and Implant Retention

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Background

- \mathbf{O} \mathbf{T} \mathbf{O}

 Prosthetic joint infection (PJI) rates range from 0.5-2%. Debridement, antibiotics, and implant retention (DAIR) remains a viable option in management. Factors that may impact DAIR success rates include viability of local tissue, persistence of sinus tract, duration of symptoms, microbiologic pathogen, and other common surgical risk factors. This study evaluates the success rate for hip and knee PJIs following DAIR in relation to microbiological composition, antimicrobial treatment. 			Median Age (Minimum, Maximum) ye Female Smoking Status Current Former Never	ears	N=49 61 (24, 83) 32 (65%) 5 (10%) 20 (41%) 24 (49%)		
and antimicrobial duration. Methods			Body Mass Index 18.5-24.9 25.0-29.9 >30.0		5 (10%) 12 (24%) 32 (65%)		
 Single-center, retrospective, cross-sectional study to evaluate knee and hip PJI outcomes of DAIR with respect to the microbiological composition and antimicrobial therapy. Patients admitted January 2017 to May 2020 meeting the following criteria: 			Comorbidities Diabetes Mellitus Chronic Kidney Disease Immunocompromised Rheumatoid arthritis		16 (33%) 5 (10%) 9 (18%) 3 (6%)	16 (33%) 5 (10%) 9 (18%) 3 (6%)	
 Inclusion Ages 18-99 years 	Inclusion Criteria Exclusion Criteria Ages 18-99 years • Prisoners		Symptoms Joint pain Joint Swelling Drainage / Sinus Tract		47 (96%) 37 (76%) 22 (45%)		
 First occurrence of knee infection Undergone DAIR 2 weeks percentered 	 First occurrence of prosthetic hip or knee infection Undergone DAIR followed by at least 3 weeks parenteral antimicrobial Hisohers PJI of any joint other than hip or knee Previous history of surgical intervention &/or antimicrobials for PJI in the joint in question Surgical interventions other than DAIR 		Fever Leukocytosis Limited Ambulation	17 (35%) 15 (31%) 9 (18%)	17 (35%) 15 (31%) 9 (18%)		
therapy			Table 2: Outcomes	Foiluro (NI-21) Domission $(NI-28)$	Total $(N - 40)$	
 Consolidative & chronic/indefinite oral antimicrobial therapy allowed Fungal PJI 		Location of PJI Hip Knee	6 (40%) 15 ($AA\%$)	9 (60%) 19 (56%)	15 3/		
 Baseline demographics, clinical characteristics, and patient outcomes were collected for comparison. Data were summarized using descriptive statistics. 			Time to PJI Early (<3 months) Delayed (3-12 months) Late (>12 Months) Bacteromia Present	7 (41%) 7 (41%) 0 (0%) 14 (47%) 3 (43%)	10(59%) $10(59%)$ $2(100%)$ $16(53%)$ $4(57%)$	17 2 30 7	
Primary Outcome	Evaluation of failur -Any subsequent ne -Infection related m -Persistent infection treatment failure of	e at 2 years after DAIR defined as: eed for surgical intervention ortality a, new infection, or probable prosthetic hip or knee	Dacterenna Fresent Time to DAIR < 3 weeks	3 (43%) 20 (46%) 1 (17%) 2 (13%) 9 (64%)	4 (37%) 23 (54%) 5 (83%) 13 (87%) 5 (36%)	7 43 6 15 14	
Secondary Outcome	 -Time to failure -Infection related mortality -Duration of antimicrobial therapy -Chronic (indefinite) suppressive antimicrobial therapy -Adverse advents from antimicrobial therapy 		Methicillin sensitive Culture negative <i>Streptococcus</i> species Gram-negative Coagulase-negative staphylococci Polymicrobial <i>Cutibacterium</i> <i>Enterococcus</i> species	8 (62%) $3 (27%)$ $2 (33%)$ $2 (40%)$ $1 (25%)$ $2 (50%)$ $1 (33%)$ $1 (50%)$	$5 (38\%) \\8 (73\%) \\4 (67\%) \\3 (60\%) \\3 (75\%) \\2 (50\%) \\2 (67\%) \\1 (50\%)$	13 11 6 5 4 4 3 2	

 Prosthetic joint infection (PJI) rates range from 0.5-2%. Debridement, antibiotics, and implant retention (DAIR) remains a viable option in monoport. 		N=49 Median Age (Minimum Maximum) years 61 (24, 83)				
• Eactors that may	impact DAID success rates include visbility of local	Female		01(24, 03) 22(650/)	01(24, 05) 32(65%)	
tissue persistence	a of sinus tract duration of symptoms microbiologic	remale Smalling Staturg		52 (05%)		
nothegon and of	bor common survised right feators	Smoking Status		5(100/)		
patnogen, and ot	ner common surgical risk factors.	Current		3(10%) 20(41%)	5(10%) 20(41%)	
• This study evaluation	ates the success rate for hip and knee PJIs following	Former Never		20(41%) 21(40%)	20(41%) $2\Lambda(\Lambda 9\%)$	
DAIR in relation	to microbiological composition, antimicrobial treatment,			24 (4970)		
and antimicrobia	l duration.	Body Mass Index		5(100/)		
		16.3 - 24.9 25 0_29 9		5(10%) 12(24%)	5(10%) 12(24%)	
Methods		>30.0		$\frac{12}{24}$	32(65%)	
		Comorbidition		52 (0570)		
• Single-center, re	trospective, cross-sectional study to evaluate knee and hip	Diabatas Mallitus		16 (33%)		
PJI outcomes of	DAIR with respect to the microbiological composition and	Chronic Kidney Disease	5(10%)	5(10%)		
antimicrobial the	erapy.	Immunocompromised		9(18%)	S(10%) Q(18%)	
• Patients admitte	d January 2017 to May 2020 meeting the following criteria:	Rheumatoid arthritis	Rheumatoid arthritis		3(10/0) 3(6%)	
- anomy administry summing 2017 to may 2020 mouthing the following children.		Symptoms				
		Ioint pain		47 (96%)		
Inclusion	Criteria Exclusion Criteria	Joint Swelling		37 (76%)		
	• Duis ou aug	Drainage / Sinus Tract		22(45%)		
 Ages 18-99 years Eirst occurrence of 	 Prisoners DU of only joint other than his on lynca 	Fever		17 (35%)	17(35%)	
 First occurrence of know infection 	 PJI of any joint other than inp of knee Provious bistory of surgical 	Leukocytosis		15 (31%)	15(31%)	
 Undergone DAIR 	followed by at least intervention $\&/or$ antimicrobials for	Limited Ambulation		9 (18%)	9 (18%)	
3 weeks parentera	l antimicrobial PII in the joint in question	Table 2: Outcomes				
 b) Weeks parenteral antimicrobial therapy (in the joint in question) c) Surgical interventions other than DAIR (e.g., one-stage or two-stage revision) c) Fungal PJI 			Foiluro (N-21)	Domission $(N-28)$	Total $(N - 40)$	
		Looption of DII	Family $(1)-21$	Kennssion (11–20)	IUtal (11–47)	
		Location of PJ1				
	• Fungai PJI	Uin	6(100)	0(60%)	15	
	• Fungal PJI	Hip Knee	6(40%) 15(44\%)	9(60%) 19(56%)	15 34	
	• Fungar PJ1	Hip Knee Time to DU	6 (40%) 15 (44%)	9 (60%) 19 (56%)	15 34	
Baseline demogr	raphics, clinical characteristics, and patient outcomes	Hip Knee Time to PJI Forly (<2 months)	6 (40%) 15 (44%) 7 (41%)	9 (60%) 19 (56%)	15 34 17	
• Baseline demogrammed were collected for	raphics, clinical characteristics, and patient outcomes or comparison.	Hip Knee Time to PJI Early (<3 months) Delayed (3, 12 months)	6 (40%) 15 (44%) 7 (41%) 0 (0%)	9 (60%) 19 (56%) 10 (59%) 2 (100%)	15 34 17 2	
 Baseline demogra were collected for Data were summer 	raphics, clinical characteristics, and patient outcomes or comparison. harized using descriptive statistics.	Hip Knee Time to PJI Early (<3 months) Delayed (3-12 months) Late (>12 Months)	$6 (40\%) \\ 15 (44\%) \\ 7 (41\%) \\ 0 (0\%) \\ 14 (47\%)$	9 (60%) 19 (56%) 10 (59%) 2 (100%) 16 (53%)	15 34 17 2 30	
 Baseline demograties were collected for Data were summer 	• Fungal PJI raphics, clinical characteristics, and patient outcomes or comparison. harized using descriptive statistics.	Hip Knee Time to PJI Early (<3 months) Delayed (3-12 months) Late (>12 Months)	6 (40%) 15 (44%) 7 (41%) 0 (0%) 14 (47%)	9 (60%) 19 (56%) 10 (59%) 2 (100%) 16 (53%)	15 34 17 2 30 7	
 Baseline demograties were collected for Data were summer 	• Fungar PJI raphics, clinical characteristics, and patient outcomes or comparison. harized using descriptive statistics.	 Hip Knee Time to PJI Early (<3 months) Delayed (3-12 months) Late (>12 Months) Bacteremia Present 	6 (40%) 15 (44%) 7 (41%) 0 (0%) 14 (47%) 3 (43%)	9 (60%) 19 (56%) 10 (59%) 2 (100%) 16 (53%) 4 (57%)	15 34 17 2 30 7	
 Baseline demogra were collected fe Data were summ 	 Fungar PJI Fungar PJI raphics, clinical characteristics, and patient outcomes or comparison. harized using descriptive statistics. Evaluation of failure at 2 years after DAIR defined as: 	Hip Knee Time to PJI Early (<3 months) Delayed (3-12 months) Late (>12 Months) Bacteremia Present Time to DAIR	$ \begin{array}{c} 6 (40\%) \\ 15 (44\%) \\ 7 (41\%) \\ 0 (0\%) \\ 14 (47\%) \\ 3 (43\%) \\ \end{array} $	9 (60%) 19 (56%) 10 (59%) 2 (100%) 16 (53%) 4 (57%)	 15 34 17 2 30 7 	
 Baseline demogravere collected for Data were summ 	 Fungar PJT raphics, clinical characteristics, and patient outcomes or comparison. harized using descriptive statistics. Evaluation of failure at 2 years after DAIR defined as: -Any subsequent need for surgical intervention 	Hip Knee Time to PJI Early (<3 months) Delayed (3-12 months) Late (>12 Months) Bacteremia Present Time to DAIR < 3 weeks > 3 weeks	$ \begin{array}{c} 6 (40\%) \\ 15 (44\%) \\ 7 (41\%) \\ 0 (0\%) \\ 14 (47\%) \\ 3 (43\%) \\ \begin{array}{c} 20 (46\%) \\ 1 (17\%) \\ \end{array} $	9 (60%) 19 (56%) 10 (59%) 2 (100%) 16 (53%) 4 (57%) 23 (54%) 5 (83%)	15 34 17 2 30 7 43 6	
 Baseline demogravere collected fere collected fere summer Data were summer Primary 	 Fungar PJT Fungar PJT raphics, clinical characteristics, and patient outcomes or comparison. narized using descriptive statistics. Evaluation of failure at 2 years after DAIR defined as: Any subsequent need for surgical intervention Infection related mortality 	Hip Knee Time to PJI Early (<3 months) Delayed (3-12 months) Late (>12 Months) Late (>12 Months) Bacteremia Present Time to DAIR < 3 weeks > 3 weeks > 3 weeks	$ \begin{array}{c} 6 (40\%) \\ 15 (44\%) \\ 7 (41\%) \\ 0 (0\%) \\ 14 (47\%) \\ 3 (43\%) \\ \begin{array}{c} 20 (46\%) \\ 1 (17\%) \\ \end{array} $	9 (60%) 19 (56%) 10 (59%) 2 (100%) 16 (53%) 4 (57%) 23 (54%) 5 (83%)	 15 34 17 2 30 7 43 6 15 	
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Results

 Table 1: Patient Characteristics

DISCLOSURE: The authors of this presentation have nothing to disclose concerning possible financial or commercial entities that may have a direct or indirect interest in the subject of this presentation.

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Results, Continued



Figure 2: Oral Antimicrobials



Discussion

- We observed a failure rate similar to published literature despite a majority of cases in our study undergoing intervention within 3 weeks of symptom onset.
- Need for further surgical intervention was the leading cause of failure.
- Nearly half of failures occurred while still on parenteral therapy.
- No failures occurred on chronic/indefinite suppressive oral antimicrobial therapy. • S. aureus was the most common pathogen identified among patients with failure, suggesting this virulent pathogen may warrant careful consideration prior to DAIR. • Further studies are needed to characterize risk factors for failure among patients
- undergoing DAIR.

	1.	Edwards JR, M
References	2.	December 2009 Koh, CK, Zeng
		Knees Clin Ort

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- After completion of therapy
- During chronic/indefinite suppression (0%)

IStat, Peterson, KD, et al. "National Healthcare Safety Network (NHSN) report: Data summary for 2006 through 2008, issued 9." AJIC: American Journal of Infection Control, vol. 37, no. 10, 2009, pp. 783-805. g, I, Ravi, S, et al. Periprosthetic Joint Infection Is the Main Cause of Failure for Modern Knee Arthroplasty: An Analysis of 11,134 Knees. Clin Orthop Relat Res 475, 2194–2201 (2017).