CENTRES DE RÉFÉRENCE
POUR LES INFECTIONS OSTÉO-ARTICULAIRES COMPLEXES
DU GRAND OUEST
CRIOGO

Best of 2024 : chirurgie orthopédique

Louis-Romée Le Nail
Chirurgie orthopédique
CRIOGO – Tours

Journée annuelle – Poitiers
24 janvier 2025

14ème journée scientifique du CRIOGO

Vendredi 24 janvier 2025
Poitiers : Salons de Blossac

Méthodologie

- Pubmed
- 2024
- « Bone joint infection surgery »
- 865 articles

Définitions…

J. Bone Joint Infect., 9, 127–136, 2024
https://doi.org/10.5194/jbji-9-127-2024

JBJI Journal of Bone and Joint Infection Open Access

USA

Changing the definition of treatment success alters treatment outcomes in periprosthetic joint infection: a systematic review and meta-analysis

Eytan M. Debbi[1], Tyler Khilnani[1], Ioannis Gkiatas[1], Yu-Fen Chiu[2], Andy O. Miller[3], Michael W. Henry[3], and Alberto V. Carli[1]

Table 1. Definition of success following treatment for periprosthetic joint infection (PJI) by tier, modified from Fillingham et al. (2019).

Tier	Definition of prosthetic joint infection (PJI) treatment success
Tier 1	No further surgery; no suppressive antibiotic therapy
Tier 2	No further surgery; antibiotic suppressive therapy permitted
Tier 3A	No septic revision surgery, but aseptic revision over 1 year post-initiation of PJI treatment is permitted
Tier 3B	No revision surgery within 1 year post-initiation of PJI treatment, but septic or aseptic revision after 1 year are permitted; no salvage-type procedures (arthrodesis, resection arthroplasty, amputation)
Tier 3C	No septic revision surgery within 1 year post-initiation of PJI, but aseptic revision surgery within 1 year is permitted; no salvage-type procedures (arthrodesis, resection arthroplasty, amputation)
Tier 3D	No salvage-type procedures (arthrodesis, resection arthroplasty, amputation)
Tier 3E	No spacer retained; salvage-type procedures (arthrodesis, resection arthroplasty, amputation) are permitted
Tier 3F	Spacer may be retained
Tier 4A	No death within 1 year from initiation of PJI treatment
Tier 4B	Survival analysis only

M&M

2006-2021

PJI chronique PTH PTG

Définition du « succès »:

Résultats

245 études

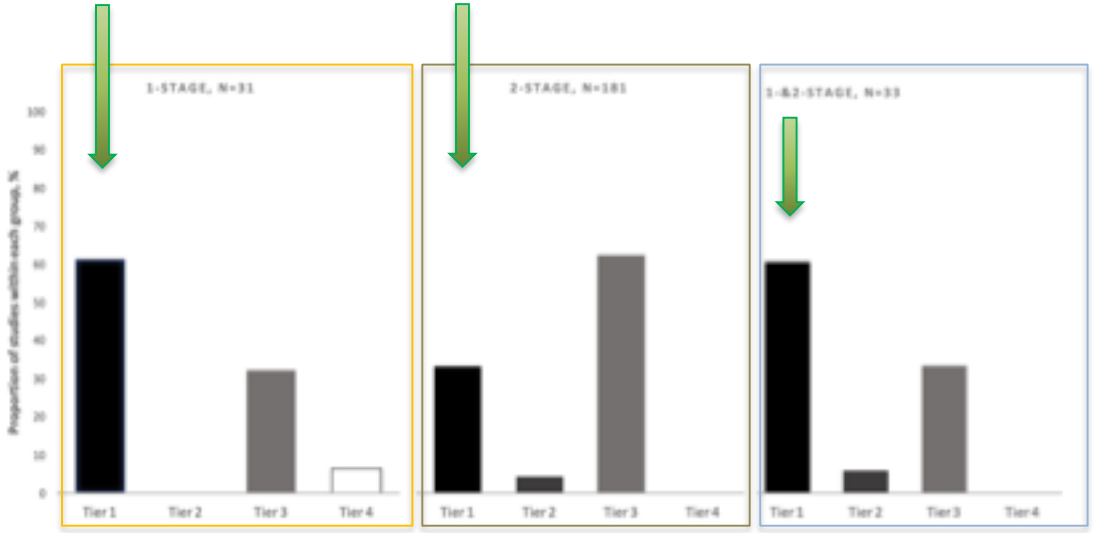


Figure 4. Proportion of hip and knee periprosthetic joint infection (PJI) studies reporting outcomes of one-stage, two-stage, or one- and two-stage revisions categorized by the definition of success used (tiers 1–4; see Table 1).

ATTENTION AUX DEFINITIONS

2T, « vrai » DAIR et méga prothèses

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org

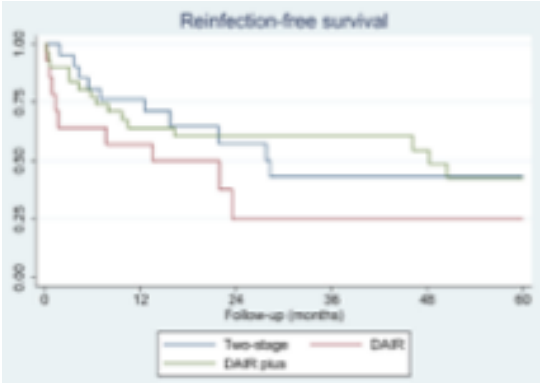
Complications - Infection

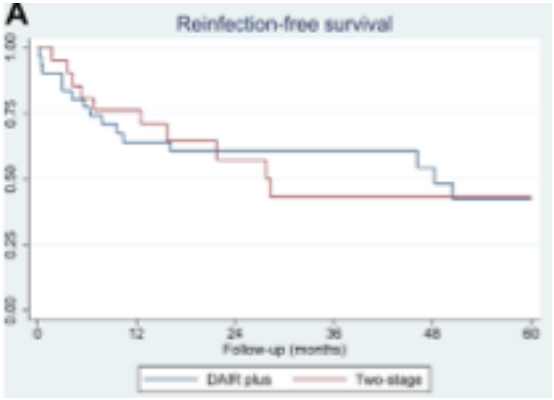
Debridement, Antibiotics, and Implant Retention (DAIR) *Plus* Offers Similar Periprosthetic Joint Infection Treatment Success Rates to Two-Stage Revision in Oncologic Megaprosthesis

Marcos R. Gonzalez, MD [a], José I. Acosta, BS [a, b, c], Marilee J. Clunk, MS [a, d], Angad D.S. Bedi, BS [a], Daniel Karczewski, MD [a], Erik T. Newman, MD [a], Kevin A. Raskin, MD [a], Santiago A. Lozano-Calderon, MD, PhD [a, *]

USA

Résultats





M&M

- Mégaprothèses mb inf
- Rétrospectif, FU > 1an

- Groupes:
  - 14 DAIR
  - 31 « DAIR + » : changement de tout sauf des ancrages
  - 21 2T

Comparables sauf : + de chronique dans 2T

+

Définition claire
PEC moins lourde

-

+ de chronique dans les 2T (3 mois)
Prolongement en atb suppressif floue…

Variable	DAIR (n = 14)	DAIR Plus (n = 31)	2-Stage (n = 21)	P
PJI classification				.002
Acute PJI (<90 d)	11 (79%)	13 (42%)	4 (19%)	
Chronic PJI (>90 d)	3 (21%)	18 (58%)	17 (81%)	

J Shoulder Elbow Surg (2024) 33, S122–S129

JOURNAL OF SHOULDER AND ELBOW SURGERY

www.elsevier.com/locate/ymse

High failure rate of 2-stage revision for the infected total elbow arthroplasty: a single institution's experience

Corey J. Schiffman, MD[a,*], William Baker, DO[b], Daniel Kwak, BS[c], Matthew L. Ramsey, MD[d], Surena Namdari, MD[d], Luke S. Austin, MD[d]

USA

Coude

- Prothèse totale de coude : 10% infection
- Pb stock osseux++ et couverture

⇒ Expérience du 2T

M&M

Rétrospectif

2006-2020

Ancrages solides laissés en place

Ciment chargé aux atb puis 6 sem atb

2ème T: allogreffe si besoin

Table II Risk factors for repeat infection

	Total (N = 19)	Nonrepeat infection (n = 10)	Repeat infection (n = 9)	OR	*P* value
Sex					.350
Female	7	5	2		
Male	12	5	7	3.18 (0.44-33.1)	
CCI	3	3 (2.00-3.00)	3 (1.00-5.00)	1.15 (0.77-1.72)	.928
Diabetic					.335
No	12	8	4		
Yes	7	2	5	3.90 (0.52-42.3)	
Smoker					.179
No	10	7	3		
Yes	9	3	6	4.18 (0.62-36.0)	
Indication for primary TEA					>.999
Distal humerus fracture	1	0	1		
Inflammatory arthritis	5	3	2		
Post-traumatic arthritis	13	7	6		
Surgery between primary TEA and 2-stage revision					>.999
No	10	5	5		
Yes	9	5	4	0.81 (0.12, 5.30)	
Bacteria species					>.999
Increased inflammatory markers					.559
No	4	3	1		
Yes	10	4	6	3.81 (0.31-136)	
Grossly loose					.559
No	3	1	2		
Yes	15	9	6	0.37 (0.01-5.56)	
Retained component					.350
No	12	5	7		
Yes	7	5	2	0.31 (0.03-2.26)	
Retained cement					.370
No	9	6	3		
Yes	10	4	6	2.78 (0.42-21.9)	
Repeat debridements between first and second stage					>.999
No	15	8	7		
Yes	4	2	2	1.13 (0.10-13.4)	
Allograft					.656
No	10	6	4		
Yes	9	4	5	1.80 (0.28-12.7)	

TEA, total elbow arthroplasty; *CCI*, Charlson Comorbidity Index; *OR*, odds ratio.
Continuous data are presented as median (first quartile, third quartile) and categorical data are presented as cell count (%). Mann-Whitney *U* tests were used to compare continuous data and Fisher exact were used to compare categorical data. Odds ratios are also included to better illustrate the results than via *P* values.

Résultats

19 malades : 9 échecs (49%)…

Pas d'influence

. des implants/ciment laissés en place

. Utilisation allogreffe en reconstruction

Ablation des implants associé à + d'allogreffe pour la reconstruction

+

PTC = rare

Complications+++ -> article honnête

Conserver les ancrages (faire vrai DAIR?)

-

Hétérogène

Petits sous groupes

Technique chirurgicale

Surgical Technique

HIP International

The anterior femoral cortical window as an alternative to an extended trochanteric osteotomy in revision hip arthroplasty surgery: the evolution of the surgical technique and outcomes in 22 consecutive cases

HIP International
1–8

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Sage

NZ

David Morley[1], Michael C Wyatt[2,3] and John van Dalen[1]

- Pb fémorotomie:
  Étendue
  - Saignement, douleurs
  - Mécanique : pseudarthrose, notamment gd troch
    - ➔ Défaillance appareil abducteur = boiterie
- Ablation tiges cimentées

Technique

- Voie antéro latérale
- Extraction de la tige
- Corticotomie antérieure à partir du bd inf petit troch -> bd sup bouchon
  avec/sans guide de coupe sur mesure
- Ablation ciment puis tige longue pontant la fenêtre
- Repositionnement du capot

\+

Consolidation des capots (21/22) malgré le dépériostage

Pas d'interruption de l'appareil abducteur

\-

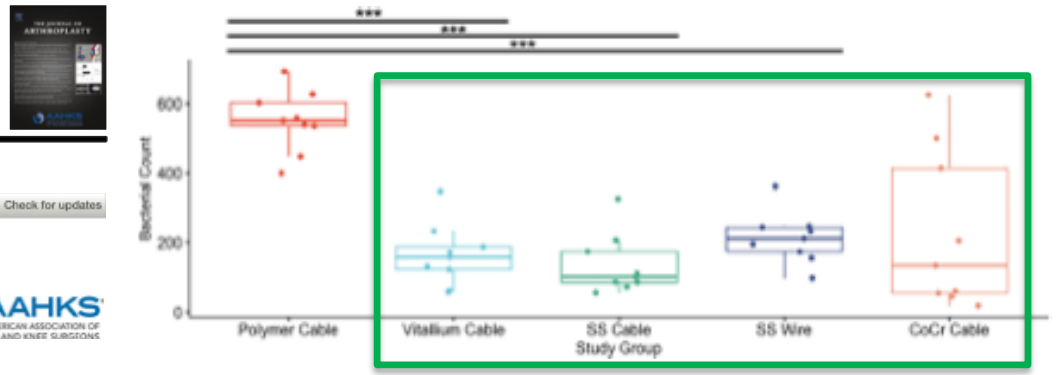
Exhaustivité de l'ablation du ciment?

Matériel d'ostéosynthèse par cerclage

Contents lists available at ScienceDirect

The Journal of Arthroplasty

journal homepage: www.arthroplastyjournal.org



ning electron microscopy assay for bacterial adhesion counts of cable/wire middle sections. Boxplots displaying bacterial adhesion cou

2023 AAHKS Proceedings

Biofilm Growth on Orthopaedic Cerclage Materials: Nonmetallic Polymers Are Less Resistant to Methicillin-Resistant *Staphylococcus Aureus* Bacterial Adhesion

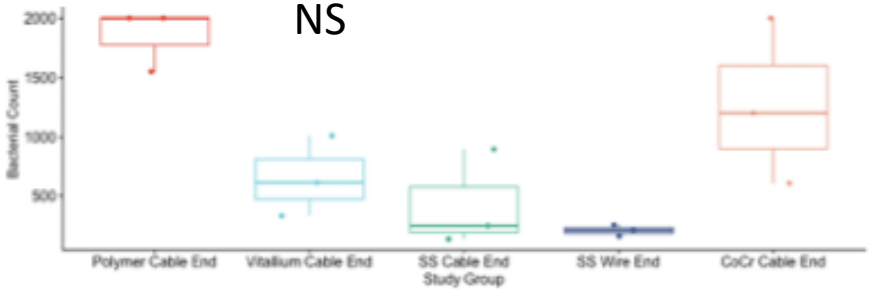
Kyle H. Cichos, PhD [a, b, *], Matthew C. Christie, MD [c], Brent A. Ponce, MD [b], Elie S. Ghanem, MD [d]

Cerclage : seul matériel laissé en place

Multiples matériels disponibles

- mono/multi filament
- Matériaux :
  - Inox/titane/alliage CrCoMolybdène
  - Polymères non métalliques

NS



ning electron microscopy assay for bacterial adhesion counts of cable/wire cut ends. Boxplots displaying bacterial adhesion counts for ea

M&M

In vitro

Analyse :

- milieu de dispositif & extrémités
- SARM
- adhérence bactérienne
- activité métabolique

Charge bactérienne polymère > métal

Inox / vitallium monobrin ou câble : meilleurs résultats

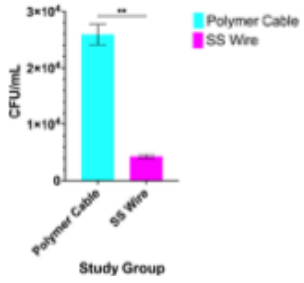


Fig. 6. Isothermal microcalorimetry assay results comparing SS wire and polymer cables for MRSA bacterial CFU counts. Boxes represent mean CFU/mL counts of 3

In Vitro

Outil d'évaluation du risque – obésité et PJI

Preoperative Laboratory Values Predicting Periprosthetic Joint Infection in Morbidly Obese Patients Undergoing Total Hip or Knee Arthroplasty

Sagar Telang, BS, Cory K. Mayfield, MD, Ryan Palmer, BS, Kevin C. Liu, BS, Julian Wier, MD, Kurt Hong, MD, PhD, Jay R. Lieberman, MD, and Nathanael D. Heckmann, MD

Investigation performed at the Keck School of Medicine of the University of Southern California, Los Angeles, California

M&M

- > 40 kg/m2, adultes
- PTH PTG 1ère intention
- 2016-2021
- Base de données: 25% de la pop° USA
- Bilan bio <1mois pré op
- Critère: PJI dans les 3 mois

Résultats

FDR:

- anémie, anomalie plaquettes,
- Élévation : lympho/neutro, plaquette/lympho, systemic immune infl index

Pas PJI 6733 pt — PJI 47 pt

TABLE VI Regression Models for Morbidly Obese Patients with and without PJI After TJA

Laboratory Value	% with Laboratory Value Meeting Clinical Threshold*		Univariate Regression			Multivariable Regression†		
	No PJI	PJI	OR	P Value	95% CI	aOR	P Value	95% CI
Neutrophil	8.89%	10.34%	1.18	0.784	0.36-3.92	N/A	N/A	N/A
Monocyte	17.84%	16.13%	0.89	0.804	0.34-2.31	N/A	N/A	N/A
TLC	21.54%	38.71%	2.30	**0.024**	1.11-4.75	1.93	0.120	0.84-4.41
Leukocyte	6.99%	6.82%	0.97	0.964	0.30-3.15	N/A	N/A	N/A
Neutro/lympho ratio	20.27%	37.93%	2.40	**0.023**	1.13-5.11	2.38	**0.039**	1.04-5.44
Mono/lympho ratio	27.01%	35.48%	1.49	0.293	0.71-3.11	N/A	N/A	N/A
Plaq/lympho ratio	16.66%	45.16%	4.12	**<0.001**	2.02-8.39	4.86	**<0.001**	2.15-10.95
Systemiq imm infl index	27.26%	48.28%	2.49	**0.014**	1.20-5.17	2.44	**0.029**	1.09-5.44
Platelet	4.33%	13.64%	3.49	**0.005**	1.46-8.32	3.50	**0.032**	1.11-10.99
Albumin	10.90%	18.75%	1.89	0.164	0.77-4.61	N/A	N/A	N/A
Alb/glob ratio	23.31%	36.00%	1.85	0.142	0.81-4.21	N/A	N/A	N/A
Hemoglobin	16.27%	34.15%	2.67	**0.003**	1.39-5.11	2.62	**0.038**	1.06-6.50
HbA1c	7.98%	13.33%	1.77	0.454	0.40-7.95	N/A	N/A	N/A

*The number of patients for whom each laboratory test was available (see Table III) was used for the denominator. †N/A = not applicable.

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Intérêt bilan pré op systématique

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Valeurs seuil

Prévention

Hamoudi et al.
Journal of Orthopaedics and Traumatology (2024) 25:37
https://doi.org/10.1186/s10195-024-00775-1

Journal of Orthopaedics and Traumatology

ORIGINAL ARTICLE Open Access

Cement loaded with high-dose gentamicin and clindamycin does not reduce the risk of subsequent infection after aseptic total hip or knee revision arthroplasty: a preliminary study

Strasbourg

Ceyran Hamoudi[1], Marie Hamon[2], Aurélie Reiter-Schatz[1], Pierre-Antoine Debordes[1], Jeannot Gaudias[1], Cécile Rondé-Oustau[1] and Jean-Yves Jenny[1,3,4*]

Table 5 Location of arthroplasty

	Control group ($n = 145$)	Study group ($n = 13$)	Significance
Hip (SSI/no SSI)	1/57	8/76	0.08
Knee (SSI/no SSI)	7/80	5/56	1.00

* Denotes a significant difference

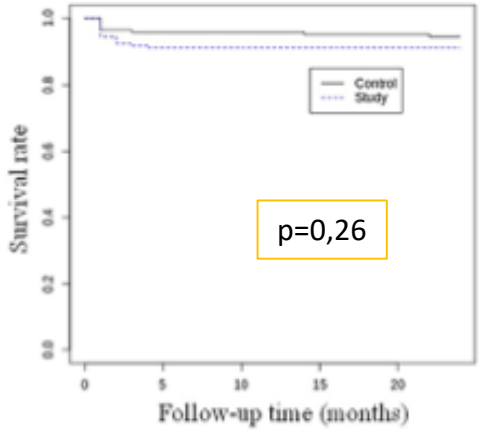

Fig. 1 Kaplan–Meier survival curves: cases without SSI

Ciment chargé Genta et Clinda haute dose vs ciment Genta dans les reprises PTH PTG non infectieuses

Table 4 Time to diagnosis of SSI

	Control group ($n = 8$)	Study group ($n = 13$)	Significance
Early (< 3 months)	6	13	0.13
Late (> 3 months)	2	0	

* Denotes a significant difference

M&M

Rétrospectif monocentrique
2015-2020. Suivi 2 ans.
Cefazo per op

Ciment:
- contrôle (SALBC): 0,5 g genta
- chargé atb (DALBC): 1g genta + 1g clinda

Résultats

145/145 pts
Descellement aseptique++
DALBC: plus âgés, plus de hanche

- Pas de différence entre les 2 groupes (taux et délais)
- Cas d'IOA: résistance à la genta et clinda
  - Contrôle : 2/8 résistant à la clinda et genta (25%)
  - DALBC: 6/13 (46%)
- Effet néfaste sur la hanche? (P=0,08)

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Pas d'intérêt sur reprise aseptique

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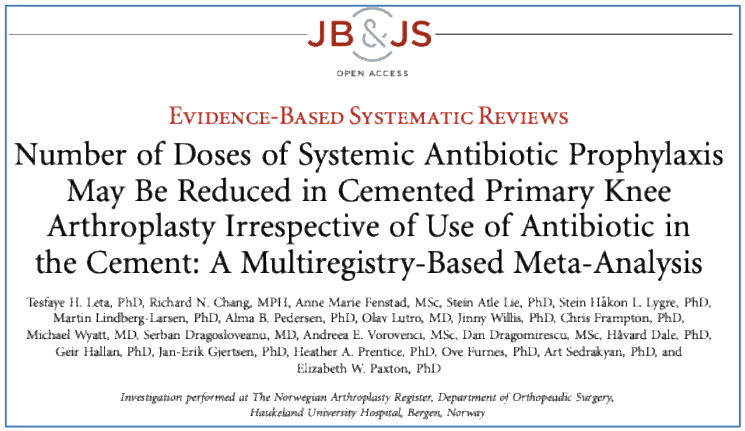
Pas d'analyse statistique sur la résistance : augmentée?

Prévention



JB&JS OPEN ACCESS

EVIDENCE-BASED SYSTEMATIC REVIEWS

Number of Doses of Systemic Antibiotic Prophylaxis May Be Reduced in Cemented Primary Knee Arthroplasty Irrespective of Use of Antibiotic in the Cement: A Multiregistry-Based Meta-Analysis

Tesfaye H. Leta, PhD, Richard N. Chang, MPH, Anne Marie Fenstad, MSc, Stein Atle Lie, PhD, Stein Håkon L. Lygre, PhD, Martin Lindberg-Larsen, PhD, Alma B. Pedersen, PhD, Olav Lutro, MD, Jinny Willis, PhD, Chris Frampton, PhD, Michael Wyatt, MD, Serban Dragosloveanu, MD, Andreea E. Vorovenci, MSc, Dan Dragomirescu, MSc, Håvard Dale, PhD, Geir Hallan, PhD, Jan-Erik Gjertsen, PhD, Heather A. Prentice, PhD, Ove Furnes, PhD, Art Sedrakyan, PhD, and Elizabeth W. Paxton, PhD

Investigation performed at The Norwegian Arthroplasty Register, Department of Orthopaedic Surgery, Haukeland University Hospital, Bergen, Norway

Intérêt ATB ciment PTG ?

Nb dose ATB prophylaxie ?

M&M

290 000 PTG 1ère intention

Registres: Dannemark, Roumanie, NZ, Norvège, USA

2010-2020

Ciment avec ATB (ALBC) ou sans (PBC)

ATB prophylaxie (SAP): 1, 2, 3 ou 4 doses

Résultats

Influence de la présence d'atb dans le ciment:

TABLE III Revision Proportion (%) for PJI Following pTKAs With ALBC + SAP vs. PBC + SAP Per Registry (2010-2020)

Register (Country)	pTKA n (% Within Register)	Revision for PJI n (% of Primary)
Total (pooled) (n = 289,926)		
ALBC + SAP	186,758 (64.4)	1,795 (0.96)
PBC + SAP	103,168 (35.6)	1,011 (0.98)

< 1% PJI

Influence du nb de dose d'atb post op:

Groupe ciment chargé aux antibio

➔ **Pas de bénéfice 2, 3 ou 4 doses versus 1 dose.**

Groupe ciment sans antibio

➔ **Plus de risque de révision pour PJI groupe 4 doses vs 1 dose**

+

Nb malades

Confirme nos pratiques

-

2 questions posées

Pas info sur type ATB du ciment

Explication sur risque avec ATB : malades à risque?

Prévention

Contents lists available at ScienceDirect

The Journal of Arthroplasty

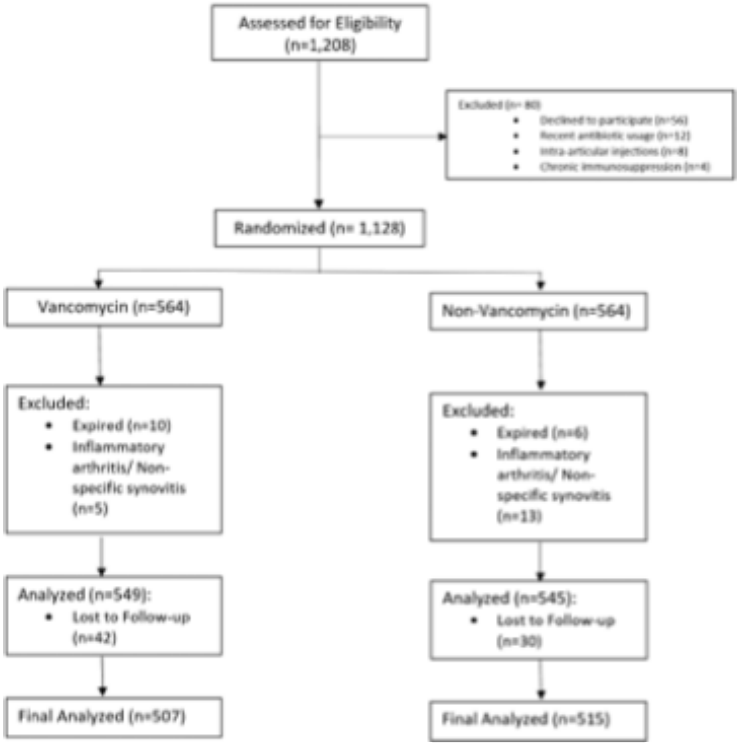
journal homepage: www.arthroplastyjournal.org

Complications - Infection

Efficacy of Intrawound Vancomycin in Prevention of Periprosthetic Joint Infection After Primary Total Knee Arthroplasty: A Prospective Double-Blinded Randomized Control Trial

Praharsha Mulpur, DNB (Ortho) [a], Tarun Jayakumar, MS (Ortho) [a, *], Ramakanth R. Yakkanti, MD [b], Aditya Apte, MS (Ortho), DNB (Ortho), MRCS [a], Kushal Hippalgaonkar, DNB (Ortho) [a], Adarsh Annapareddy, MS (Ortho) [a], A.B. Suhas Masilamani, MS (Ortho), DNB (Ortho) [a], A.V. Gurava Reddy, D.(Ortho), DNB (Ortho), MCh (Ortho) [a]

Inde



M&M

PTG cimentées (sans atb), pas resurfaçage rotule, garrot

Groupe vanco : 2g en intra articulaire

Groupe contrôle : rien

Drainage?

Résultats

Pas d'intérêt sur risque PJI

Augmente le risque d'écoulement cicatriciel

Pas d'influence systémique

Summary of Complications in the Study Population

Complication	Study Group n (%)	Control Group n (%)	P Value
Major Complications			
Surgical Site Infections (SSI)	1 (0.2)	2 (0.38)	1[a]
Periprosthetic joint infection (PJI)	1 (0.2)	3 (0.58)	.624[a]
Periprosthetic fracture	2 (0.39)	0	.246[a]
Minor complications			
Persistent wound drainage	47 (9.27)	26 (5.04)	.012[b]
Stitch abscess	20 (3.94)	13 (2.52)	.268[b]
Delayed stitch removal (>3 wk)	36 (7.1)	36 (6.99)	.957[b]
Medical complications			
Septic shock and MODS	0	1	
DVT	0	1	
CVA	0	0	
Acute kidney injury/Nephrotoxicity	0	0	
Cardiac complications	0	0	NS[a]

\+ -

Prospectif rando aveugle

Merci de votre attention