

Table i. Microbiological spectrum and detailed information related to the samples selected for the study. Microbiological analysis was performed on synovial fluid for preoperative joint aspirations and tissue(s) and/or sonication fluid for surgical procedures at the time of sample(s) collection.

Samples	Total	Synovial fluid	Tissue(s)/sonication fluid
Synovial fluid, n (%)	268 (100)	57/268 (21.3)	211/268 (78.7)
Culture-negative cases, n (%)	122/268 (45.5)	37/122 (30.3)	85/122 (69.7)
Culture-positive cases, n (%)	146/268 (54.5)	20/146 (13.7)	126/146 (86.3)
Monomicrobial cases, n (%)	128/146 (88)	20/128 (15.6)	108/128 (84.4)
Polymicrobial cases, n (%)	18/146 (12.3)	0	18/18 (100)
Single-positive intraop culture cases, n (%)	67/146 (46.6)	0	67/146 (46)
Overall microorganisms, n (%)	167 (100)	19/167 (11.4)	148/167 (88.6)
<i>Staphylococcus epidermidis</i>, n (%)	35/167 (20.9)	3/167 (1.8)	32/167 (19.2)
MRSE	19/167 (11.3)	1/167 (0.6)	18/167 (10.8)
MSSE	16/167 (9.6)	2/167 (1.2)	14/167 (8.4)
<i>Staphylococcus aureus</i>, n (%)	19/167 (11.4)	3/167 (1.2)	16/167 (10.2)
MSSA	15/167 (9.0)	3/167 (1.8)	12/167 (7.2)
MRSA	4/167 (2.4)	0	4/167 (2.4)
Other CoNS, n (%)	23/167 (13.8)	5/167 (3)	18/167 (10.8)
Other Gram-positive bacteria, n (%)	50/167 (30)	6/167 (3.6)	44/167 (26.3)
<i>Streptococcus</i> spp	11/167 (6.6)	3/167 (1.8)	8/167 (4.8)
<i>Actinomyces odotolyticus</i>	1/167 (0.6)	0	1/167 (0.6)
<i>Bacillus</i> spp	4/167 (2.4)	0	4/167 (2.4)
<i>Corynebacterium</i> spp	2/167 (1.2)	0	2 /167 (1.2)
<i>Cutibacterium acnes</i>	9/167 (5.4)	0	9/167 (5.4)
<i>Cutibacterium avidum/granulosus</i>	3/167 (1.8)	1/167 (0.6)	2/167 (1.2)
<i>Enterococcus faecalis</i> (VSE)	9/167 (5.4)	2/167 (1.2)	7/167 (4.2)
<i>Enterococcus faecium</i> (VSE)	2/167 (1.2)	0	2 /167 (1.2)
<i>Micrococcus luteus</i>	8/167 (4.8)	0	8/167 (4.8)
<i>Parvimonas micra</i>	1/167 (0.6)	0	1/167 (0.6)
Gram-negative bacteria, n (%)	27/167 (16.2.6)	3/167 (1.8)	24/167 (14.4)
<i>Acinetobacter radioresistens</i>	1/167 (0.6)	0	1/167 (0.6)
<i>Citrobacter koseri</i>	2/167 (1.2)	0	2/167 (1.2)
<i>Escherichia coli</i>	5/167 (3.0)	0	5/167 (3.0)
<i>Escherichia coli</i> (ESBL 3-MRGN)	3/167 (1.8)	0	3/167 (1.8)
<i>Haemophilus parainfluenzae</i>	2/167 (1.2)	2/167 (1.2)	0
<i>Moraxella osloensis</i>	1/1 67 (0.6)	0	1/167 (0.6)
Proteus spp	4/167 (2.4)	0	4/167 (2.4)
<i>Pseudomonas aeruginosa</i>	4/167 (2.4)	0	4/167 (2.4)

<i>Raoultella ornithinolytica</i>	2/167 (1.2)	1/167 (0.6)	1/167 (0.6)
<i>Roseomonas mucosa</i>	1/167 (0.6)	0	1/167 (0.6)
<i>Rothia aeria</i>	1/167 (0.6)	0	1/167 (0.6)
Salmonella spp	1/167 (0.6)	0	1/167 (0.6)
<i>Candida</i> spp	13/167 (7.8)	0	13/167 (7.8)

ConS, coagulase-negative staphylococci; MRGN, multidrug-resistant gram-negative bacteria; MRSA, methicillin-resistant *Staphylococcus aureus*; MRSE, methicillin-resistant *Staphylococcus epidermidis*; MSSE, methicillin-susceptible *Staphylococcus epidermidis*; MSSA, methicillin-susceptible *Staphylococcus aureus*; single-positive intraop, single-positive intraoperative; VSE, vancomycin-susceptible enterococci.

Table ii. Comparison of results from conventional microbiological analysis of synovial fluid and JI panel evaluation of matched synovial fluid.

Group	Case	Culture standard results	JI panel - species identified in matched synovial fluid
Culture-positive JI 'on-panel' microorganism(s)	1	<i>Enterococcus faecalis</i> (VSE)	<i>Enterococcus faecalis</i> (VSE)
	2	<i>Streptococcus viridans</i>	<i>Streptococcus</i> spp
	3	<i>Staphylococcus lugdunensis</i>	<i>Staphylococcus lugdunensis</i>
	4	<i>Staphylococcus lugdunensis</i>	<i>Staphylococcus lugdunensis</i>
	5	<i>Staphylococcus aureus</i> (MSSA)	<i>Staphylococcus aureus</i> (MSSA)
	6	<i>Staphylococcus lugdunensis</i>	<i>Staphylococcus lugdunensis</i>
	7	<i>Staphylococcus aureus</i> (MSSA)	<i>Staphylococcus aureus</i> (MSSA)
	8	<i>Streptococcus agalactiae</i>	<i>Streptococcus agalactiae</i>
	9	<i>Cutibacterium avidum/granulosum</i>	<i>Cutibacterium avidum/granulosum</i>
	10	<i>Streptococcus agalactiae</i>	<i>Streptococcus agalactiae</i>
	11	<i>Staphylococcus lugdunensis</i>	<i>Staphylococcus lugdunensis</i>
	12	<i>Staphylococcus aureus</i> (MSSA)	<i>Enterococcus faecium</i> (VRE), <i>Staphylococcus aureus</i> (MSSA)
	13	<i>Enterococcus faecalis</i> (VSE)	<i>Enterococcus faecalis</i> (VSE), <i>Finneglodia magna</i> , <i>Peptoniphilus</i> , <i>Streptococcus</i> spp
Culture-positive 'off-panel' microorganism(s)	14	<i>Haemophilus parainfluenzae</i>	None
	15	<i>Haemophilus parainfluenzae</i>	None
	16	<i>Staphylococcus capitis</i>	None
	17	<i>Staphylococcus epidermidis</i> (MRSE)	None
	18	<i>Staphylococcus epidermidis</i> (MSSE)	None
	19	<i>Staphylococcus epidermidis</i> (MSSE)	None
	20	<i>Raoultella ornithinolytica</i>	None
Culture-negative	21-55	negative	None
	56	negative	<i>Streptococcus</i> spp
	57	negative	<i>Streptococcus</i> spp

JI, joint infection; MRGN, multidrug-resistant gram-negative bacteria; MRSA, methicillin-resistant *Staphylococcus aureus*; MRSE, methicillin-resistant *Staphylococcus epidermidis*; MSSE, methicillin-susceptible *Staphylococcus epidermidis*; MSSA, methicillin-susceptible *Staphylococcus aureus*; VSE, vancomycin-susceptible enterococci.

Table iii. Comparison of results from conventional microbiological analysis of tissue(s) and/or sonication fluid and joint infection panel evaluation of matched synovial fluid.

Group	Case	Culture standard results	Jl panel - species identified in matched synovial fluid
Single-intraoperative positive culture JI 'on-panel' microorganism	1	<i>Candida parapsilosis</i>	None
	2	<i>Candida parapsilosis</i>	None
	3	<i>Enterococcus faecium</i> (VSE)	None
	4	<i>Enterococcus faecalis</i> (VSE)	None
	5	<i>Enterococcus faecalis</i> (VSE)	None
	6	<i>Candida parapsilosis</i>	None
	7	<i>Candida parapsilosis</i>	None
	8	<i>Enterococcus faecalis</i> (VSE)	None
	9	<i>Candida parapsilosis</i>	None
	10	<i>Streptococcus pseudopneumoniae</i>	None
	11	<i>Escherichia coli</i> (ESBL 3-MRGN)	None
	12	<i>Candida albicans</i>	<i>Candida albicans</i>
	13	<i>Cutibacterium avidum</i>	<i>Cutibacterium avidum/granulosum</i>
	14	<i>Enterococcus faecalis</i> (VSE)	<i>Enterococcus faecalis</i> (VSE)
	15	<i>Enterococcus faecalis</i> (VSE)	<i>Enterococcus faecalis</i> (VSE)
	16	<i>Escherichia coli</i>	<i>Escherichia coli</i>
	17	<i>Pseudomonas aeruginosa</i>	<i>Pseudomonas aeruginosa</i>
	18	<i>Staphylococcus aureus</i> (MRSA)	<i>Staphylococcus aureus</i> (MRSA)
	19	<i>Staphylococcus aureus</i> (MSSA)	<i>Staphylococcus aureus</i> (MSSA)
	20	<i>Staphylococcus aureus</i> (MSSA)	<i>Staphylococcus aureus</i> (MSSA)
	21	<i>Staphylococcus lugdunensis</i>	<i>Staphylococcus lugdunensis</i>
	22	<i>Streptococcus agalactiae</i>	<i>Streptococcus agalactiae</i>
	23	<i>Streptococcus agalactiae</i>	<i>Streptococcus agalactiae</i>
	24	<i>Streptococcus agalactiae</i>	<i>Streptococcus agalactiae</i>
	25	<i>Streptococcus agalactiae</i>	<i>Streptococcus agalactiae</i>
Multi-positive intraoperative cultures with at least one JI 'on-panel' microorganism	26	<i>Pseudomonas aeruginosa</i> , <i>Candida parapsilopsis</i>	None
	27	<i>Corynebacterium jeikeium</i> , <i>Candida parapsilosis</i>	None
	28	<i>Pseudomonas aeruginosa</i> , <i>Escherichia coli</i> , <i>Staphylococcus epidermidis</i> (MRSE)	None
	29	<i>Candida parapsilosis</i> , <i>Micrococcus luteus</i>	None
	30	<i>Staphylococcus epidermidis</i> (MRSE), <i>Cutibacterium avidum</i>	None
	31	<i>Cutibacterium acne</i> , <i>Staphylococcus aureus</i> (MSSA)	None
	32	<i>Bacillus pumilus</i> , <i>Staphylococcus epidermidis</i> (MRSE), <i>Enterococcus faecium</i> (VSE)	None
	33	<i>Pseudomonas aeruginosa</i>	None
	34	<i>Staphylococcus aureus</i> (MSSA)	<i>Staphylococcus aureus</i> (MSSA)
	35	<i>Candida albicans</i>	<i>Candida albicans</i>
	36	<i>Parvimonas micra</i>	<i>Parvimonas micra</i>
	37	<i>Proteus mirabilis</i>	<i>Proteus</i> spp
	38	<i>Proteus mirabilis</i>	<i>Proteus</i> spp

	39	<i>Salmonella</i> spp	<i>Salmonella</i> spp
	40	<i>Staphylococcus aureus</i> (MRSA)	<i>Staphylococcus aureus</i> (MRSA)
	41	<i>Proteus mirabilis</i>	<i>Anaerococcus prevotii</i> , <i>Finnegoldia magna</i> , <i>Proteus</i> spp, <i>Peptoniphilus</i> , <i>Staphylococcus aureus</i> (MSSA)
	42	<i>Candida albicans</i>	<i>Candida albicans</i> , <i>Staphylococcus aureus</i> (MSSA)
	43	<i>Candida glabrata</i>	<i>Candida</i> spp
	44	<i>Staphylococcus aureus</i> (MSSA), <i>Proteus mirabilis</i>	<i>Staphylococcus aureus</i> (MSSA), <i>Proteus</i> spp
	45	<i>Candida glabrata</i> , <i>Staphylococcus epidermidis</i> (MRSE)	<i>Candida</i> spp
	46	<i>Staphylococcus aureus</i> (MSSA)	<i>Staphylococcus aureus</i> (MSSA)
	47	<i>Citrobacter koseri</i> , <i>Staphylococcus epidermidis</i> (MRSA)	<i>Citrobacter</i> spp
	48	<i>Staphylococcus aureus</i> (MSSA)	<i>Staphylococcus aureus</i> (MSSA)
	49	<i>Citrobacter koseri</i>	<i>Citrobacter</i> spp
	50	<i>Staphylococcus aureus</i> (MRSA)	<i>Staphylococcus aureus</i> (MRSA)
	51	<i>Enterococcus faecalis</i> (VSE)	<i>Enterococcus faecalis</i> (VSE)
	52	<i>Staphylococcus aureus</i> (MRSA)	<i>Staphylococcus aureus</i> (MRSA)
	53	<i>Enterococcus faecalis</i> (VSE)	<i>Enterococcus faecalis</i> (VSE)
	54	<i>Staphylococcus aureus</i> (MSSA), <i>Staphylococcus epidermidis</i> (MRSE)	<i>Staphylococcus aureus</i> (MSSA)
	55	<i>Escherichia coli</i>	<i>Escherichia coli</i>
	56	<i>Staphylococcus aureus</i> (MSSA)	<i>Staphylococcus aureus</i> (MSSA)
	57	<i>Escherichia coli</i>	<i>Escherichia coli</i>
	58	<i>Staphylococcus aureus</i> (MSSA)	<i>Staphylococcus aureus</i> (MSSA)
	59	<i>Escherichia coli</i>	<i>Escherichia coli</i>
	60	<i>Staphylococcus lugdunensis</i>	<i>Staphylococcus lugdunensis</i>
	61	<i>Escherichia coli</i> (ESBL 3-MRGN)	<i>Escherichia coli</i> CTX-M
	62	<i>Staphylococcus epidermidis</i> (MSSE), <i>Staphylococcus lugdunensis</i>	<i>Staphylococcus lugdunensis</i>
	63	<i>Escherichia coli</i> (ESBL 3-MRGN)	<i>Escherichia coli</i> CTX-M
	64	<i>Streptococcus agalactiae</i>	<i>Streptococcus agalactiae</i>
	65	<i>Staphylococcus aureus</i> (MSSA)	none
	66	<i>Streptococcus mutans</i>	<i>Streptococcus</i> spp
	67	<i>Streptococcus dysgalactiae</i>	<i>Streptococcus</i> spp
Single-positive intraoperative culture JI 'off-panel' microorganism	68	<i>Staphylococcus capitis</i>	<i>Staphylococcus aureus</i> (MSSA)
	69	<i>Staphylococcus epidermidis</i> (MRSE)	None
	70	<i>Staphylococcus haemolyticus</i>	None
	71	<i>Cutibacterium acnes</i>	None
	72	<i>Staphylococcus epidermidis</i> (MRSE)	None
	73	<i>Staphylococcus epidermidis</i> (MSSE)	None
	74	<i>Staphylococcus epidermidis</i> (MSSE)	None
	75	<i>Staphylococcus xylosus</i>	None
	76	<i>Cutibacterium acnes</i>	None
	77	<i>Bacillus cereus</i>	None

	78	<i>Staphylococcus epidermidis</i> (MRSE)	None
	79	<i>Cutibacterium acnes</i>	None
	80	<i>Staphylococcus capitis</i>	None
	81	<i>Staphylococcus haemolyticus</i>	None
	82	<i>Bacillus licheniformis</i>	None
	83	<i>Staphylococcus epidermidis</i> (MSSE)	None
	84	<i>Cutibacterium acnes</i>	None
	85	<i>Micrococcus luteus</i>	None
	86	<i>Actinomyces odotolyticus</i>	None
	87	<i>Staphylococcus hominis</i>	None
	88	<i>Staphylococcus epidermidis</i> (MRSE)	None
	89	<i>Staphylococcus hominis</i>	None
	90	<i>Micrococcus luteus</i>	None
	91	<i>Raoultella ornithinolytica</i>	None
	92	<i>Micrococcus luteus</i>	None
	93	<i>Micrococcus luteus</i>	None
	94	<i>Staphylococcus capitis</i>	None
	95	<i>Staphylococcus. warneri</i>	None
	96	<i>Corynebacterium tuberculostearicum</i>	None
	97	<i>Micrococcus luteus</i>	None
	98	<i>Staphylococcus epidermidis</i> (MSSE)	None
	99	<i>Staphylococcus epidermidis</i> (MRSE)	None
	100	<i>Micrococcus luteus</i>	None
	101	<i>Roseomonas mucosa</i>	None
	102	<i>Staphylococcus epidermidis</i> (MSSE)	None
	103	<i>Staphylococcus capitis</i>	None
	104	<i>Staphylococcus haemolyticus</i>	None
	105	<i>Cutibacterium acnes</i>	None
	106	<i>Cutibacterium acnes</i>	None
	107	<i>Staphylococcus cohnii</i>	None
	108	<i>Staphylococcus epidermidis</i> (MSSE)	None
	109	<i>Micrococcus luteus</i>	None
Multi-positive intraoperative cultures JI 'off- panel' microorganism(s)	110	<i>Staphylococcus epidermidis</i> (MRSE)	None
	111	<i>Staphylococcus epidermidis</i> (MRSE)	None
	112	<i>Staphylococcus epidermidis</i> (MRSE)	None
	113	<i>Staphylococcus Caprae</i>	None
	114	<i>Staphylococcus epidermidis</i> (MRSE)	None
	115	<i>Staphylococcus epidermidis</i> (MRSE)	None
	116	<i>Staphylococcus epidermidis</i> (MRSE)	None
	117	<i>Staphylococcus epidermidis</i> (MRSE)	None

	118	<i>Staphylococcus epidermidis</i> (MSSE)	None
	119	<i>Rothia aeria</i> , <i>Acinetobacter radioresistens</i>	None
	120	<i>Staphylococcus epidermidis</i> (MSSE), <i>Cutibacterium acnes</i>	None
	121	<i>Staphylococcus epidermidis</i> (MRSE)	None
	122	<i>Cutibacterium acne</i> , <i>Staphylococcus epidermidis</i> (MRSE)	None
	123	<i>Staphylococcus epidermidis</i> (MSSE)	None
	124	<i>Bacillus mycoides</i> , <i>Moraxella osloensis</i>	None
	125	<i>Staphylococcus epidermidis</i> (MSSE), <i>Staphylococcus hominis</i>	None
	126	<i>Staphylococcus epidermidis</i> (MSSE), <i>Staphylococcus hominis</i>	None
Culture-negative	127-202	Negative	None
	203	Negative	<i>Candida albicans</i>
	204	Negative	<i>Staphylococcus aureus</i> (MSSA)
	205	Negative	<i>Staphylococcus aureus</i> (MSSA)
	206	Negative	<i>Staphylococcus lugdunensis</i>
	207	Negative	<i>Staphylococcus lugdunensis</i>
	208	Negative	<i>Streptococcus</i> spp
	209	Negative	<i>Streptococcus</i> spp (<i>Streptococcus agalactiae</i>)
	211	Negative	<i>Streptococcus</i> spp (<i>Streptococcus agalactiae</i>)

Jl, joint infection; MRGN, multidrug-resistant gram-negative bacteria; MRSA, methicillin-resistant *Staphylococcus aureus*; MRSE, methicillin-resistant *Staphylococcus epidermidis*; MSSE, methicillin-susceptible *Staphylococcus epidermidis*; MSSA, methicillin-susceptible *Staphylococcus aureus*; VSE, vancomycin-susceptible enterococci.

Table iv. Overall changes in the initial microbiological spectrum of the study after usage of the BioFire Joint Infection panel technology.

Group	Microbiological results vs JI panel results	Additional pathogens (%)
Other CoNS	23 vs 25	+2 (8.7)
<i>Staphylococcus aureus</i>	19 vs 24	+5 (26.3)
Other Gram-positive	51 vs 63	+12 (12.4)
Gram-negative	26 vs 27	+1 (3.8)
<i>Candida</i> spp	13 vs 14	+1 (7.7)
Total number of microorganisms	167 vs 188	+21 (12.6)

ConS, coagulase-negative staphylococci; JI, joint infection.

Table v. Detailed description of the 20 negative joint infection panel results in the culture-positive group with 'on-panel' microorganisms.

Case, n	Case description	Periprosthetic tissue(s)	Sonication fluid	Jl panel - species identified in matched synovial fluid
1	Single-intraoperative positive culture JI 'on-panel' microorganism	<i>Candida parapsilosis</i>		None
2		<i>Candida parapsilosis</i>		None
3		Negative	<i>Enterococcus faecium</i> (VSE)	None
4		<i>Enterococcus faecalis</i> (VSE)		None
5		<i>Enterococcus faecalis</i> (VSE)		None
6		<i>Candida parapsilosis</i>		None
7		negative	<i>Candida parapsilosis</i>	None
8		<i>Enterococcus faecalis</i> (VSE)		None
9		<i>Candida parapsilosis</i>		None
10		<i>Streptococcus pseudopneumoniae</i>		None
11		<i>Escherichia coli</i> (ESBL 3-MRGN)		None
12	Multi-positive intraoperative cultures with at least one JI 'on-panel' microorganism	<i>Staphylococcus aureus</i> (MSSA)	<i>Staphylococcus aureus</i> (MSSA)	None
13		<i>Pseudomonas aeruginosa</i>	<i>Candida parapsilosis</i>	None
14		<i>Corynebacterium jeikeium</i>	<i>Candida parapsilosis</i>	None
15		<i>Pseudomonas aeruginosa, Escherichia coli</i>	negative	None
16		<i>Micrococcus luteus</i>	<i>Candida parapsilosis</i>	None
17		<i>Staphylococcus epidermidis</i> (MRSE), <i>Cutibacterium avidum</i>	<i>Staphylococcus epidermidis</i> (MRSE)	None
18		<i>Cutibacterium acnes</i>	<i>Staphylococcus aureus</i> (MSSA)	None
19		<i>Bacillus pumilus</i>	<i>Staphylococcus epidermidis</i> (MRSE), <i>Enterococcus faecium</i> (VSE)	None
20		<i>Pseudomonas aeruginosa</i>	<i>Pseudomonas aeruginosa</i>	None

Jl, joint infection; MRGN, multidrug-resistant gram-negative bacteria; MRSA, methicillin-resistant *Staphylococcus aureus*; MRSE, methicillin-resistant *Staphylococcus epidermidis*; MSSE, methicillin-susceptible *Staphylococcus epidermidis*; MSSA, methicillin-susceptible *Staphylococcus aureus*; VSE, vancomycin-susceptible enterococci.