

Appendix 1 Baseline characteristics of included articles concerning Brodie's Abscess

First author	Year of publication	Country	Included patients n=	Age in years	Sex M/F	Presenting complains	Duration of complaints in months	Fever?	Raised ESR?	Raised WBC?	Raised CRP?	imaging	Location of abscess	Culture	Treatment (surgical conservative duration ab)	Follow-up in months	Functional outcome
Abbas(1)	2012	UK	1	42	M	Hx of minor trauma, progressive pain	1.5	NR	NR	NR	NR	X, CT, MRI	Tibia, proximal L	S. aureus	Surgery and prolonged course flucloxacilline	NR	'well'
Abdelghani(2)	2014	Tunisia	1	10	F	Rhinopharyngitis, pain and limp	1	Yes	Yes	NR	Yes	X, MRI	Metatarsal L	Not obtained	Conservative (Augmentin 1500mg/day for 45 days)	24	Favourable
Abdulhadi(3)	2012	USA	1	9	F	Hx of fall	2 days	Yes	Yes	Yes	Yes	X, MRI	Tibia, prox R	S. aureus (MRSA)	Surgery and oral ABx	NR	NR
Abril(4)	2000	Spain	3	5	M	Non-traumatic, intermittent pain	0.75	No	Yes	No	NR	X, technetium, CT	Femur prox R	NEG	Surgery	84	Asymptomatic
				13	M	Pain and limp	1.5	No	No	No	NR	X, technetium, CT	Femur prox R	NEG	Surgery	24	Asymptomatic
				6	M	Non-traumatic, pain and limp	6	No	Yes	No	NR	X, technetium, CT	Femur prox L	NEG	Surgery and 6 weeks ABx	24	Asymptomatic
Agrawal(5)	2016	India	1	14	M	Progressive pain and limp	3	No	Yes	No	No	X, MRI	Femur, proximal L	S. aureus	Surgery and ABx based on sensitivity	6	MRI no recurrence
Al-Jafar(6)	2015	Kuwait	1	21	F	Intermittent pain, sickle cell disease	24	NR	NR	NR	NR	SPECT /CT	Talus L	NR	Surgery and 10 days ABx	18	No pain or swelling
Alter(7)	1995	USA	1	11	F	Non-traumatic, progressive pain and limp	6	NR	Yes	No	NR	X, SPECT	Tibia, distal R	S. aureus	Surgery and oxacillin IV 1,5gr a4hr, cefazolin a8h 6 weeks.	12	X no recurrence

															Reconstruction with homogenous cancellous bone NWB 6weeks		
Amanul lah(8)	2013	Nepal	1	15	F	Non-traumatic, pain	6	NR	No	No	No	X, MRI	Tibia prox L	S. aureus	Surgery, Flucloxacilline	NR	Condition improved and no complication
Amin(9)	2008	Pakistan	1	13	M	pain	3	NR	NR	NR	NR	X, SPECT /CT	Tibia, distal, L	NR	Surgery and high dose ABx	NR	No pain, symptoms or recurrence
Bagatur(10)	2003	Turkey	1	28	F	Non-traumatic, pain, swelling and limp	3	No	No	NR	NR	X, MRI	Cuboid R	S. aureus	Surgery and Cefuroxim 2wk IV 4wk oral	72	No complaints, X and MRI: no recurrence
Balaji(11)	2014	India	1	11	M	Non-traumatic, progressive pain	2	No	Yes	Yes	NR	X, CT	Iliac bone R	NEG	Surgery and ABx 6 wks	10	Painless and no recurrence
Basma ci(12)	2013	France	1	21month	F	Hx of pharyngitis, progressive pain and limp	10days	No	NR	Yes	No	X	Femur dist R	K. kingae	Surgery and ABx: 5day iV cefamandole (140mg/kg/day) followed by oral amoxicillin (100mg/kg/day) for 5 weeks	3	Clinical and biologic features normal
Behera (13)	2017	India	1	9	M	Intermittent pain	3	No	Yes	No	No	X, CT, MRI, SPECT	Iliac bone R	S. aureus	Surgery and cloxacillin 2wks IV, 4wks oral.	18	No recurrence
Berman(14)	1990	USA	1	30	M	Hx of minor trauma, pain and	2/4	NR	NR	NR	NR	X, MRI, technetium	Femur diaphyse R	S. aureus	Surgery, 6 weeks IV ABx	NR	No symptoms or radiograph

						swelling											hic signs
Bogoch (15)	1984	Canada	6	9.5	6x NR	3x Hx of trauma, 3x non-traumatic, 6x pain and swelling	5	No	2x No 4x Yes	4xNo 2x Yes	6x NR	6x X, 3x technetium (2x POS)	2x tibia prox, 3x tibia dist, 1x femur dist	3x S. aureus, 1x NEG	4x surgical debridement and 6wkns ABx 2x long term ABx no surgery	>30	No growth disturbance, no radiographic recurrence
Bonmati(16)	1993	Spain	10	Mean 20	7x M, 3x F	10x progressive pain	NR	No	NR	NR	NR	MRI	8x long bones (6x metaphyseal, 2x diaphyseal) 2x vertebrae	NR	Surgery	NR	NR
Boriani(17)	1980	Italy	181	40% in second decade, exact numbers not reported	125x M 56x F	181x NR	NR	NR	NR	NR	NR	X	1x Cranium, 1x scapula, 4x pelvis, 33x femur prox, 9x femur midshaft, 13x femur dist, 1x patella, 52x tibia prox, 15x tibia midshaft, 22x tibia dist, 4x fibula midshaft, 5x fibula midshaft, 4x calcaneus, 7x	90x S. aureus, 36x NEG	NR	NR	NR

													humerus prox, 4x humerus midshaft, 4x humerus dist, 1x ulna prox, 3x radius dist					
Buldu(18)	2012	Turkey	1	26	F	Non-traumatic, pain	1	No	No	NR	No	X, MRI	Tbia, proximal, bilateral	NEG	Surgery, 2wks IV cefazolin, oral cefuroxime bd 4wkns	NR	NR	
Chamber(19)	1997	UK	1	17	M	Non-traumatic, progressive pain	NR	No	Yes	NR	NR	X	Tibia dist bilateral	S. aureus	Surgery and 6 wks ABx	18	Pain free playing sports. Normal physical and lab works	
Chan(20)	2011	Malaysia	1	27	M	pain	1	NR	NR	NR	NR	CT, MRI	Femur midshaft	NR	Surgery twice. 1x oral cloxacillin, 1x extended course of cefoperazone	4	MRI: marrow oedema, no abscess	
Contreras(21)	2000	Spain	1	32	M	Hx of childhood injury, pain and swelling	1	No	Yes	NR	NR	Technetium, MRI	Tibia distal R	S. aureus (MRSA)	NR	NR	NR	NR
Day(22)	1989	USA	1	14	M	pain	Unknown	NR	NR	NR	NR	X	Tibia, dist bilateral	NR	NR	NR	NR	NR
Dhileepan(23)	2015	India	1	23	M	Non-traumatic, pain	2	NR	NR	NR	NR	X, CT, MRI	Tibia dist R	S. aureus	Surgery (with cementing)	NR	NR	
Dunn(24)	1991	USA	1	16	M	Hx of trauma, swelling	24	No	NR	NR	NR	X, bone scan	Tibia dist R	S. aureus	Surgery 2x 6 wks penicillin iv	1yr	X and clinic: no recurrence	

Durel(25)	2016	France	1	29	M	Pain, weight loss	NR (relapse after 1 year)	NR	NR	NR	Yes	X, CT, MRI	Tibia diaphyse L	Salmonella saprophyticus	Pre-op course ceftriaxon, surgery, post-op oral ofloxacin in total 6 months	24	Favourable
Edmundson(26)	2009	Ireland	1	11	M	Hx Trauma, progressive pain	NR	NR	No	No	Yes	X, MRI	Tibia, dist R	NEG	Aspirate and washout of ankle joint 6weeks ABx	12	Asymptomatic
Fitzer(27)	1978	USA	1	86	M	Hx trauma, sinus tract	65years	NR	NR	NR	NR	X, CT	Tibia prox R	Pseudomonas, chromobacter	None	NR	NR
Foster(28)	2018	USA	14	4	8x M 6x F	2x Pain/swelling/limp, 4x pain, 1x sinus tract, 1x pain/swelling, 4x pain/limp, 2x limp	3weeks	10x No 4x Yes	7x Yes 7x No	7x Yes 7x No	14x No	14x X and MRI	2x Femur prox R, 1x femur prox L, 1x femur prox/bilateral, 4x femur distal R, 2x femur distal L, 1x patella L, 2x tibia prox R, 1x calcaneus L	7x MSSA, 2x MRSA, 5x unknown	2x percutaneous bone biopsy, 12x surgery, 1x no surgery All ABx, mostly: Cefazolin 1 month, cephalexin >3 months	NR	8x successful treatment, 4x readmission repeat I&D and extended ABx, 1x lost to follow-up, 1x leg length discrepancy due to femoral overgrowth
Gabbott(29)	2017	UK	1	14	M	Non-traumatic, Pain, swelling and limp	3	No	Yes	No	yes	X, MRI, US,	Femur dist R	S. aureus	Pre-op ceftriaxon 2x surgery Postop flucloxacilline iv followed by oral clindamycin	12	No growth concerns, radiograph satisfactory
Gillespie(30)	1986	New Zealand	57	NR	45x M 12x F	57x NR	NR	NR	NR	57x NR	57x NR	X and or CT	NR	NR	57x surgery, ABX not reported	NR	7 recurrences

Gorter(31)	2017	Netherlands	1	17	M	Hx trauma, pain and swelling	1/4	No	No	No	Yes	X, MRI	Acromion R	S. aureus	Surgery and IV flucloxacillin 2wk followed by oral clindamycin	12	Full recovery clinic and radiographs
Gulati(32)	2007	India	1	17	M	Non-traumatic, no previous fever, pain and limp	3	No	Yes	Yes	No	X, CT, MRI	Femur prox L	NEG	Cloxacillin/genta iv 3wks, oral cloxacillin 3wks	36	Full recovery incl sports
Hammad(33)	2015	Germany	1	17	M	Non-traumatic, progressive pain	6	NR	NR	No	Yes	X, US, MRI	Tibia prox L	S. aureus	Surgery And flucloxacillin 2wk IV and 3wk oral	3	Asymptomatic and MRI: local edema
Hourston(34)	2017	UK	1	2	M	Hx of both fall and fever. Pain and limp	48hrs	No	Yes	No	No	X, MRI	Femur prox capital epiphysis	K. kingae	Surgery and ceftriaxone 3 months IV	1.5	Radiographs: no collapse of the femoral head
Ip(35)	2008	Hong Kong	1	43	F	Non-traumatic, pain and swelling	6	No	No	No	NR	X, MRI, CT guide biopsy	Ulna diaphyse R	Salmonella typhi	Surgery and ciprofloxacin 3 weeks IV, 4 weeks oral	24	Asymptomatic, full range of motion radiographs no recurrence
Kozlowski(36)	1980	Australia	11	5.36mean	2x M 9x F	1x Hx trauma, 1x Hx UTI 10x pain, swelling limp, 1x Pain	1.6months mean	NR	3x Yes, 6x No, 2x NR	11x No	11x NR	X	2x Femur, dist R 1x Tibia prox L, 1x tibia prox R, 1x tibia midshaft R, 1x tibia dist L, 1x tibia dist R, 1x talus R,	2x S. aureus	5x surgery, 5x only ABx, 1 refused treatment	NR	NR

													1x calcaneus R, 1x calcaneus L, 1x humerus dist R				
Kurland sky(37)	1978	USA	1	11 months	M	No Hx trauma or illness, pain, swelling and functional loss	3 weeks	No	Yes	Yes	NR	X	Humerus prox R	H. influenzae	Surgery and ampicillin/chloramphenicol 48hrs, ampicillin 4 weeks	1yr	No recurrence x clinical findings, normal length arm
Kurup(38)	2005	UK	1	15	M	Discharging sinus	36	NR	NO	NR	NO	X, MRI	Tibia dist bilateral	NR	Surgery, no ABx	NR	NR
Kyi(39)	1991	UK	1	28	M	Hx of fever 3 months earlier. pain and swelling	1	No	NR	NR	NR	X, technetium scan	Tibia dist L	Eikenella corrodens	Surgery and Cephadrine followed by later ampicillin 3 weeks	NR	NR
Lindset mo(40)	1995	Norway	2	23	M	Pain and swelling	4	Yes	Yes	NR	NR	X, CT	Ilium L	S. aureus (betalactam R)	Surgery, ampicillin IV 3d, cephalexin oral	9 months	Clinic and CT scan no recurrence
				42	M	Pain, bone destruction with spinal compression	6	Yes	Yes	NR	NR	X, CT	L5/sacrum	Streptococcus viridans	Laminectomy curettage and cloxacillin 3 months, 2 further surgeries, vancomycin cloxacillin, 3 weeks. cloxacillin oral 1 yr after dental alveolotomies.	2yrs	Neurologic deficits: bladder dysfunction, obstipation, inability to achieve erection
Lofgren (41)	1949	Unknown	2	9	F	Pain, swelling and limp	1	No	2x Yes	Yes	NR	X	Tibia prox R	NEG	Surgery, penicillin and sulphadiazine.	2m	Clinical good health

				16	F	Pain, swelling and limp	12	No	NR	NR	NR	X	Fibula dist L	S. aureus	Surgery, penicillin	3	Quite well and free from trouble
Manandhar(42)	2017	Nepal	1	23	F	Progressive pain, swelling and limp	4	NR	NR	NR	NR	X, MRI	Femur dist L	NR	Athrosopic drainage and lavage and 3weeks iv/oral ABx	24	Pain free, ROM zero-120degrees
Marmor(43)	1964	USA	1	29	M	Progressive pain, swelling, weight loss	6	NR	No	Yes	NR	X	Tibia dist R	S. aureus	Surgery, 'course of treatment'	Unkown	Complete relief of pain, leucocytes to normal
McHugh(44,45)	2007	USA	1	15	M	Hx of ankle sprain. Pain and swelling	6	NR	NR	NR	NR	X, MRI	Tibia dist R	S. aureus	NR	NR	NR
Mehdinasab(46)	2007	Iran	2	14	M	Progressive pain and limp	3	Yes	Yes	Yes	No	X, gallium scan	Femur prox R	NR	No surgery, IV cephalotin/gentamicin 2weeks, oral 4weeks	5	Asymptomatic, decrease on x
				4	M	No Hx of trauma or fever. Pain and limp.	3/4	NR	Yes	No	No	X, gallium scan	Femur prox L	NR	No surgery, IV ABx 3weeks, oral 4weeks	2	Symptoms relieved, radiographic reduction lesion
Miller(47)	1977	USA	1	27	M	Hx of trauma. Pain and swelling	20	NR	NR	NR	NR	X	Patella (no lateralisation)	S. epidermidis (pre-operative specimen)	Surgery, 6 weeks flucloxacillin	NR	Resumed activity with full, painless motion of his knee
Miller(48)	1979	USA	20	21.3	13x M 7x F	5x Hx infection, 8x Hx trauma. 20x Recurrent	8.2	4x Yes, 16x No	NR	5x Yes, 15x No	20x NR	X	8x Tibia, 9x femur, 1x Radius, 1x patella, 1x	11x S. aureus, 8x NEG, 1x Proteus mirabilis	20x Surgery, ABx unknown	5months-8years	1 recurrence

						pain.							metatarsal				
Miyanihi(49)	2002	Japan	1	51	F	SLE, non-traumatic. Pain.	3	Yes	Yes	No	Yes	X, MRI, technetiumscan	Femur prox L	NEG	Prosthetic replacement left hip No ABx course is noted	NR	NR
Ogbonna(50)	2015	USA	1	20	F	No Hx trauma. Sickle cell disease, pain	5 days	Yes	NR	Yes	NR	X, MRI, CT	Femur prox bilateral	NEG	Multiple surgeries and percutaneous drainage Pre-op levofloxacin Post-op switch imipenem, switch vancomycin and levofloxacin, switch Piperacillin-Tazobactam, Switch 6 weeks IV vancomycin and piperacillin and tazobactam	3 weeks	Afebrile, decreased pain CRP 34
Ogilvie(51)	1921	UK	1	17	M	Pain and swelling	NR	NR	NR	NR	NR	X	Scapula R	S. aureus	Surgery	NR	NR
Olasinde(52)	2011	Nigeria	20	21,5 ± 7,8	15x M, 5x F	17x Pain and swelling, 3x pain	7.3weeks	20x No	5x 20±3,9 (F), 15x 36±31(M)	20x NR	20x NR	X	5x Femur metaphysis R, 1x femur diaphysis R, 1x tibia metaphysis R, 3x tibia metaphysis L, 5x tibia diaphysis	13x S. aureus, 1x MRSA, 1x Klebsiella spp, 1x P. Pseudomonas aeruginosa, 4x No Growth	Surgery with bone grafting, 2 weeks IV and 4 weeks oral ABx	32.7	Satisfactory

													R, 3x tibia diaphysis L, 1x radius diaphysis L, 1x Fibula diaphysis R				
Park(53)	2008	Korea	1	37	M	Pain and swelling	3	NR	NR	NR	NR	MRI	Tibia prox L	S. aureus	Surgery and ABx	NR	NR
Peck(54)	1968	USA	1	43	F	No Hx of illness. Pain.	8	No	No	No	NR	X	Tibia dist R	S. aureus	Surgery and ABx	3m	Clinical no recurrence
Peene(55)	1999	Belgium	1	42	M	Recurrent pain and swelling	NR	NR	NR	NR	NR	X, CT, MRI	Femur dist R	S. aureus	Surgery with genta beads, iv ABx 6 wks	NR	NR
Qi(56)	2017	Canada	1	27	M	Pain and swelling	9	No	No	No	NR	X, CT	Tibia dist L	S. aureus	Surgery with cement ABx bone filler and 6 weeks culture directed ABx	6	Recovered range of motion
Rahman(57)	1932	India	1	18	F	Pain, swelling, sinus tract	24	Yes	NR	Yes	NR	x	Tibia proximal R	S. aureus	Surgery	NR	Recovering
Ruttan(58)	2015	USA	1	14 month	M	Hx of respiratory infection. Pain and limp.	0.5	NR	Yes	Yes	No	X, MRI	Tibia prox L	K. kingae	Surgery and Clindamycin/ceftriaxone, after 1day ceftriaxone for 4weeks IV	1	X, bloodworks: no recurrence
Shah(59)	2012	UK	1	14	M	Pain and swelling	12	No	No	No	No	X, MRI	Tibia prox R	S. aureus (MRSA)	Flucloxacillin, Surgery, Augmentin 6weeks post-op	24	Clinically asymptomatic, no growth deficits
Silva(60)	1995	Puerto Rico	1	9	F	Pain	6	No	No	No	No	X, technetium scan	Femur prox L	NR	NR	NR	NR

Simmons(61)	1948	USA	1	7	F	Hx of fever and minor trauma, swelling and progressive pain	4	NR	No	No	NR	X	Tibia dist L	S. albus	Surgery	NR	NR
Stephens(62)	1988	Ireland	20	14	11x M, 9x F	20x NR	9.3	No	5x Yes, 15x No	20x No	20x NR	X	3x Femur prox, 2x femur dist, 7x tibia prox, 4x tibia dist, 1x metatarsalia, 1x phalangeal foot 1x metacarpalia, 1x radius dist, 1x phalangeal hand	11x S. aureus, 1x S. pyocyanus, 1x S. viridans, 1x Pseudomonas, 9x NEG	20x Surgery and ABx	14yrs	Clinical and x-rays, 8 recurrences
Strobel (63)	2006	Switzerland	1	28	NR	Pain	NR	NR	NR	NR	NR	Whole body FDG-PET CT and CT	Tibia prox R	NR	CT guided biopsy and surgery, no mentioning of ABx	NR	NR
Takeuchi(64)	2017	Japan	1	13	M	Pain and swelling	1	No	NR	No	No	X, MRI, CT, PET	Radius mid and dist R	NEG (taken after 6 months ABx)	Cefazolin and levofloxacin. 6 weeks later surgery	8m	Clinical no recurrence
Tan(65)	2012	UK	1	17	NR	No Hx of trauma or illness. Progressive pain	38	NR	NR	NR	NR	X, CT, MRI	Femur, dist R	S. aureus	CT-guided percutaneous biopsy, aspiration and washout 7 days iv	8	Full return to daily activity incl sports

															ceftriaxon and 6 weeks oral fucidin		and MRI improvement
Thakral (66)	2006	Ireland	1	54	M	No Hx of trauma. recurrent pain and limp.	40yrs	No	N	No	No	X, CT	Talus R	S. aureus,	Surgery and immobilisation. 6kws ciprofloxacin/ fusidic acid	1yr	Asymtpomic
Visser(67)	1982	NL	3	13	M	No Hx of illness, pain	1	No	Yes	NR	NR	X, CT	Tibia prox L	S. aureus	Surgery and 5days washout via drain	24	No growth deficits, x-rays ne recurrence
				12	F	Pain and swelling	1	No	Yes	NR	NR	X, CT	Tibia prox L	S. aureus	Surgery and 5days washout via drain	36	No growth deficits
				14	M	Pain and swelling	1	No	Yes	NR	NR	X, scinti-gram	Tibia prox R	S. aureus	Surgery and 5days washout via drain	6	Painfree, no recurrence, x-ray 6 months
Weston (68)	2015	UK	1	36	M	No Hx illness. Pain	2days	No	NR	Yes	Yes	X, MRI	Tibia proximal L and septic arthritis	Salmonella newport	Pre-op: fluclox/benzylpenicillin 3x Surgery, Post-op amoxicillin iv 8 weeks and 12 weeks oral	NR	Good improvement
Van Wiechen(69)	1984	NL	1	36	F	Non-traumatic. Pain and swelling.	24	NR	Yes	NR	NR	X, technetiumscan	Tibia prox L	Salmonella give	Surgery	NR	NR
Yazdi(70)	2012	Iran	1	17	M	Hx of trauma . Pain and swelling,	15	No	No	No	No	X, CT, MRI	Talus L	S. aureus	Surgery followed by 2weeks vancomycin/amikacin) and 4 weeks cephalixin.	20 months	Clinic and x-ray no recurrence

Yoshikawa(71)	2000	Japan	1	9	F	Pain	1	No	No	N0	N0	X, MRI, technetiumscan	Femur prox R	NR	Surgery	NR	NR
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NR=not reported

N=normal range

X=x-ray image

L=Left

R=Right

I&D=incision and drainage

ABx=antibiotic treatment

MRSA=Methicillin-resistant Staphylococcus aureus

MSSA=Methicillin-sensitive Staphylococcus aureus

Fever= temperature 38,5 or above

Raised erythrocyte sedimentation rate (ESR) =>20mm/hr

Raised white blood cell (WBC) count =>10x10⁹/L

Raised C-reactive protein (CRP) =>10mg/L

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