

## Text for Supporting Material Online

Two movies, each made from CT transverse images in sequential or stack-mode display, provide an animated flythrough of normal and pathologic bone in our hadrosaur samples. Table 1S provides a reference guide for the movie of specimen THA, indicating changes in tissue distribution and other landmarks; Table 2S provides a similar guide for the movie of specimen THB. Both movies progress from the proximal break to the distal tip of each neural spine. The image numbers (upper left corner, 5<sup>th</sup> line, on each image) serve as the index on the tables. Positions on each image are denoted using the axes labeled on the images (A, P, R, L), combined where necessary. Asterisks (\*) precede numbers of key images on which specific details can be observed. *Sample* refers to pits created during mineral sampling for geochemical analyses. *Tissues* refers to changes in distribution of typical bone tissues. *Callus* refers to changes in the expression of the callus in each image. *Structure* refers to bone anatomy, taphonomic features, and specific landmarks of interest associated with the repair. References to figures are those used in the paper; CT images in Figures 1 and 2 were reversed to align with specimen photographs.

Table 1S. Guide to features visible in CT movie of the partially healed fractures in hadrosaur bone specimen THA. The anterior edge of the specimen lies to the left (L on the image), and the isotope sample wells are located on the right lateral surface (A on the image). Image numbers increase toward the specimen's distal end; each tabular row includes notable details from the 25 higher-numbered images following the listed frame. Shading of rows indicates images displaying injury and/or repair. Empty rows omitted.

#	sample	tissues	callus	structure
0				proximal break
50		A: sclerotic cortex; P: lucent cancellous at proximal break		
75	A			
150				*160 R: four large visible canals inside brace.
175	B	*187 <b>Fig 1B</b>		R: ligament brace complete
225				PR→AL: fossil break
250		PR: thickened cortex, sclerotic interior	PR: first appearance of callus	fossil breakage; R: brace diminishes to edge
275	C		PR→PL: callus expansion	
300			PR: callus has 2 layers, defined by row of small canals	
325		P: drop in cortex attenuation; *332 <b>Fig 1C</b>	PR: callus has 2-3 layers; AR: first appearance of callus	
350		*351 <b>Fig 3A</b>	PR: callus thickens	
375	D	cortex and cancellous interior are nearly the same attenuation	P: irregular outer callus layer is more lucent than inner layer; A, AL: abrupt expansion of callus	*380 PL, *389 L: large sinuous canal
400	E	cortex fully rimmed by callus	P: outer callus layer contains numerous large canals	*403 L: large canals; *423 L:

				lucent region
425	F	cortex disrupted, nearly absent; <b>fracture plane in this interval;</b> *440 <b>Fig 1D</b>	P: callus has 2-3 layers; A, AR: large lucent areas invade cortex and cancellous areas	*440 A: voids join to exterior opening
450		P: sclerotic cortex reappears	*460 P: inner callus layer is more lucent than outer layer	*454 L: voids in interior
475	G	*490: typical organization reappears	PR: callus has 2 layers; *476 AL: void with exterior opening; callus diminishes	
500		thin cortex, large open canals in cancellous bone	PR: 2-3 layers separated by small canals; A: callus absent; AR: callus remains as thin ridge	high-attenuation spots are iron-rich diagenetic minerals in large voids
525			PR: callus drops thickness by half in this interval; A: callus absent	*537: canal through original cortex?
550	M	*548 <b>Fig 1E</b>	PR: fossil breakage removes callus; PL: callus diminishes to thin rim	R→L: fossil breakage
575				fossil breakage
600	H	mineral grains in cancellous bone	callus absent	R, AL: fossil breakage
625				RA→RP: fossil compression damage in interior
675		typical sclerotic cortex, lucent cancellous; cortex very thin		
700				compression break
725	I			
775				R: fossil break
800			RA: small callus over cortex	R→L: fossil break
825	J		A: thin callus irregularly covers original cortex	
875	L	*876 <b>Fig 1F</b>		AL: void with exterior link
900				R: specimen absent
925	K			

Table 2S. Guide to features visible in CT movie of the partially healed fractures in hadrosaur bone specimen THB. The anterior edge of the specimen lies to the left (L on the image), and the isotope sample wells are located on the left lateral surface (P on the image). Image numbers decrease toward the specimen's distal end; each tabular row includes details from the 25 lower-numbered images following the listed frame. Dark shading of rows indicates images displaying external injury and/or repair; light shading indicates images in which repair appears limited to the interior. Empty rows omitted.

#	sample	tissues	callus	structure
700				proximal break
675	Z	*656 <b>Fig 2B</b> ; thick sclerotic cortex	sharp boundary between cortex and cancellous interior	
650		large cancelli in interior		RP: fossil break
625		thickening of cortex	AR: dense callus bulge on cortical margin	R→L: fossil break
600			*585 A: row of canals between cortex and thin layer of callus	
575	Y	*574 <b>Fig 2C</b> ; scattered canals within cortex	A, L, LP, RP: row of canals parallels cortex	
550		cancellous interior expansion		
525	X	*516 <b>Fig 3F</b> ; cortex / cancellous boundary irregular	irregular lucent boundary between cortex and cancellous	
500			A: callus thins PL: callus diminished to narrow ridge	PL→R: fossil break
475		thick cortex and sharp internal boundary restored		high-attenuation spots in interior are mineral grains
450	W		PL: ?callus ridge	circumference diminishes
425	V	L: canals in cortex		
400				RP→A: fossil break;

375		RP: cancellous interior off-center, higher attenuation		more mineral grains in interior
350	U		AR: numerous canals in cortex	
325		equal attenuation throughout	A: sparse, dispersed canals in cortex	fossil break
300		*290 <b>Fig 2E</b>		
275	T	cancellous interior off-center	RP: ?dense external callus	large fossil break; L: missing fragment
250			RP: sparse canals in cortex	fossil break
225	S	*214 <b>Fig 2F</b> ; abrupt transition to more lucent interior	R, P: numerous canals	*218 AL: radial canal
200	R	thin cortex	cortex/cancellous boundary diffuse, large canals throughout	*198 A: large sinuous canals
175				fossil break
150		RP: interior lucent, contact with cortex sharp		
125	Q	AR: cortex thickened		
100				PL: bulges are long ridges for ?tendon attachment
75	P	thin cortex, large cancelli in interior		
50				distal tip

Many of the images of bone and bone tissue sections presented in the paper are reduced versions of larger, higher-resolution photographic composites. Two original images are presented here with reference to matching figures in the text.

Figure 1S. Mediolateral section through fracture on specimen THA. Full resolution version of the composite image reduced to create Figure 3D and 3E. Scale bar in millimeters.

Figure 2S. Horizontal section through the larger callus on specimen THA, ventral to the fracture plane. Full resolution version of the composite image reduce to create Figure 3B. Scale bar in millimeters.