

Appendix Table A1 Gross morphology scores¹⁷

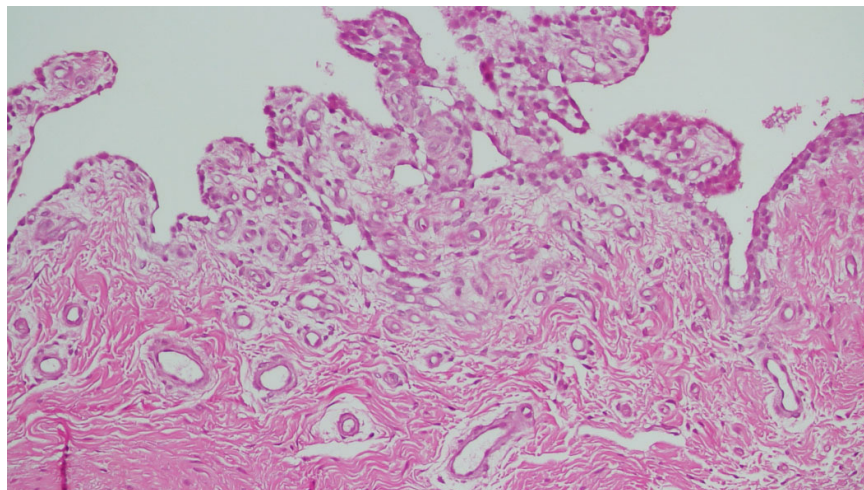
	4 points	3 points	2 points	1 point	0 point
Coverage (% fill)	> 75%	51% - 75%	25% - 50%	< 25%	bare
Neo-cartilage color (% yellow/brown/reddish)	normal/whitish	< 25%	25% - 50%	51% - 75%	> 75%
Defect margin (% circumference)	invisible	<25%	25% - 50%	51% - 75%	>75%
Surface smoothness (% irregular)	normal	smooth but raised	25% - 50%	51% - 75%	> 75%

Appendix Table A2 Histology scoring system⁹

Evaluation Items	Category	Points
1. Percent filling with neo-formed tissue	76–100%	3
	51–75%	2
	26–50%	1
	0–25%	0
2. Percent filling with neo-formed tissue in subchondral bone	76–100%	3
	51–75%	2
	26–50%	1
	0–25%	0
3. Subchondral bone morphology	Normal, trabecular bone	4
	Trabecular, with some compact bone	3
	Compact bone	2
	Compact bone and fibrous tissue	1
	Only fibrous tissue or no tissue	0
4. Extent of neo-tissue bonding with adjacent bone in subchondral bone	Complete on both edges	3
	Complete on one edge	2
	Partial on both edges	1
	Without continuity on either edge	0
5. Morphology of neo-formed surface tissue	Mainly hyaline cartilage (>75%)	8
	Hyaline cartilage mixed with fibrocartilage (50–75%)	6
	Mainly Fibrocartilage (>75%)	4
	Mainly fibrous tissue (spherical cell morphology <75% of cells)	2
	No tissue	0
6. Thickness of neo-formed cartilage	Similar to the surrounding cartilage	3
	Greater than surrounding cartilage	2
	Less than the surrounding cartilage	1
	No cartilage	0
7. Joint surface regularity	Smooth, intact surface	3
	Surface fissures (<25% neo-surface thickness)	2
	Deep fissures (25–99% neo-surface thickness)	1
	Complete disruption of the neo-surface	0
8. Chondrocyte clustering	None at all	3
	Less than 25% of chondrocytes	2
	25–100% chondrocytes	1
	No chondrocytes present (no cartilage)	0
9. Chondrocyte and GAGs content of neo-cartilage	Normal cellularity with normal Alcian blue staining	3
	Normal cellularity with moderate Alcian blue staining	2
	Obviously less cells with poor Alcian blue staining	1
	Few cells with no or little Alcian blue staining or no cartilage	0
10. Chondrocyte and GAGs content of adjacent cartilage	Normal cellularity with normal Alcian blue staining	3
	Normal cellularity with moderate Alcian blue staining	2
	Obviously less cells with poor Alcian blue staining	1
	Few cells with no or little Alcian blue staining or no cartilage	0
11. Inflammatory response in the reparative site	Normal tissue (<5% inflammatory cells)	3
	Mild inflammation (5–20% inflammatory cells)	2
	Moderate inflammation (21–50% inflammatory cells)	1
	Severe (>50% inflammatory cells)	0
Total score		39



Appendix Figure A1. Porcine health. All minipigs were able to stand within 3 days from side-lying and mini-squat (partial weight-bearing) to full knee extend (full weight-bearing) after surgery.



Appendix Figure A2. SED group knee showing synovial membrane hyperplasia.