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**Supplementary Table. 1. Statistical analysis: group comparisons (Fig. 1).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | CAL gel (+) | NV-UPAL gel (+) | CAL gel (-) | NV-UPAL gel (-) |
| **Fig. 1b 48 hours** |  |  |  |  |
| CAL gel (+) | 1 | 0.9365 | < 0.0001 | < 0.0001 |
| NV-UPAL gel (+) | 0.9365 | 1 | < 0.0001 | < 0.0001 |
| CAL gel (-) | < 0.0001 | < 0.0001 | 1 | 0.6862 |
| NV-UPAL gel (-) | < 0.0001 | < 0.0001 | 0.6862 | 1 |
| **Fig. 1d 48 hours** |  |  |  |  |
| CAL gel (+) | 1 | 0.4067 | < 0.0001 | < 0.0001 |
| NV-UPAL gel (+) | 0.4067 | 1 | < 0.0001 | < 0.0001 |
| CAL gel (-) | < 0.0001 | < 0.0001 | 1 | 0.0019 |
| NV-UPAL gel (-) | < 0.0001 | < 0.0001 | 0.0019 | 1 |
| **Fig. 1e 48 hours** |  |  |  |  |
| CAL gel (+) | 1 | 0.5342 | < 0.0001 | < 0.0001 |
| NV-UPAL gel (+) | 0.5342 | 1 | < 0.0001 | < 0.0001 |
| CAL gel (-) | < 0.0001 | < 0.0001 | 1 | 0.0007 |
| NV-UPAL gel (-) | < 0.0001 | < 0.0001 | 0.0007 | 1 |

Values obtained by one-way ANOVA with post hoc Tukey-Kramer test.

**Supplementary Table 2. Static loading test.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Measured Properties** | **Intact Control** | **Discectomy alone** | **UPAL gel** |
| Compression stiffness between -400N and -600 N curve (N/mm) | 802.3 ± 96.2 | 1001.2 ± 65.8 | 949.6 ± 60.8 |
| Compression stiffness between -600 and -1,000 N curve (N/mm) | 1050.1 ± 106.8 | 1184.7 ± 63.9 | 1151.7 ± 59.9 |
| Flexion range of motion (°) | 14.7 ± 1.3 | 15.0 ± 1.4 | 14.2 ± 0.8 |
| Extension range of motion (°) | 11.1 ± 0.9 | 10.9 ± 1.0 | 10.4 ± 1.1 |
| Right bending range of motion (°) | 11.8 ± 0.8 | 10.3 ± 1.0 | 8.7 ± 1.0 |
| Left bending range of motion (°) | 10.9 ± 0.9 | 12.1 ± 0.7 | 10.3 ± 0.8 |
| Right axial rotation range of motion (°) | 8.4 ± 0.7 | 7.6 ± 0.7 | 7.3 ± 0.6 |
| Left axial rotation range of motion (°) | 7.2 ± 1.4 | 8.2 ± 1.9 | 6.8 ± 1.1 |

Values are means ± SEM.

**Supplementary Table 3. Body weight change in rabbits (kg).**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Aspirate alone (male)** | **UPAL gel**  **(male)** |  | **Aspirate alone (female)** | **UPAL gel (female)** |
| **Days of implantation** |  |  |  |  |  |
| 1 | 3.25 ± 0.03 | 3.29 ± 0.05 |  | 3.40 ± 0.03 | 3.44 ± 0.06 |
| 8 | 3.07 ± 0.03 | 3.05 ± 0.05 |  | 3.04 ± 0.04 | 3.08 ± 0.05 |
| 15 | 3.07 ±0.02 | 3.02 ± 0.04 |  | 2.96 ± 0.04 | 2.99 ± 0.07 |
| 22 | 3.09 ± 0.03 | 3.12 ± 0.04 |  | 3.03 ± 0.05 | 3.06 ± 0.09 |
| 29 | 3.09 ± 0.03 | 3.10 ± 0.04 |  | 3.03 ± 0.06 | 3.09 ± 0.07 |
| 36 | 3.10 ± 0.04 | 3.24 ± 0.05 |  | 3.15 ± 0.07 | 3.26 ± 0.11 |
| 43 | 3.24 ± 0.04 | 3.24 ± 0.03 |  | 3.22 ± 0.07 | 3.20 ± 0.11 |
| 50 | 3.26 ± 0.04 | 3.33 ± 0.04 |  | 3.27 ± 0.08 | 3.27 ± 0.12 |
| 57 | 3.29 ± 0.05 | 3.33 ± 0.04 |  | 3.40 ± 0.04 | 3.35 ± 0.13 |
| 64 | 3.33 ± 0.04 | 3.41 ± 0.04 |  | 3.46 ± 0.06 | 3.41 ± 0.13 |
| 71 | 3.39 ± 0.02 | 3.38 ± 0.04 |  | 3.49 ± 0.04 | 3.40 ± 0.13 |
| 78 | 3.39 ± 0.02 | 3.37 ± 0.08 |  | 3.54 ± 0.06 | 3.43 ± 0.314 |
| 85 | 3.41 ± 0.05 | 3.41 ± 0.05 |  | 3.61 ± 0.05 | 3.41 ± 0.10 |
| 92 | 3.38 ± 0.01 | 3.42 ± 0.03 |  | 3.58 ± 0.05 | 3.44 ± 0.09 |
| 99 | 3.41 ± 0.05 | 3.43 ± 0.04 |  | 3.62 ± 0.04 | 3.43 ± 0.08 |
| 106 | 3.42 ± 0.03 | 3.46 ± 0.05 |  | 3.66 ± 0.05 | 3.53 ± 0.09 |
| 113 | 3.39 ± 0.03 | 3.45 ± 0.04 |  | 3.66 ± 0.08 | 3.55 ± 0.10 |
| 120 | 3.45 ± 0.04 | 3.50 ± 0.04 |  | 3.69 ± 0.06 | 3.55 ± 0.09 |
| 127 | 3.42 ± 0.03 | 3.48 ± 0.04 |  | 3.70 ± 0.06 | 3.59 ± 0.08 |
| 134 | 3.42 ± 0.02 | 3.46 ± 0.05 |  | 3.64 ± 0.06 | 3.60 ± 0.10 |
| 141 | 3.43 ± 0.03 | 3.49 ± 0.04 |  | 3.75 ± 0.07 | 3.65 ± 0.08 |
| 148 | 3.46 ± 0.02 | 3.54 ± 0.06 |  | 3.71 ± 0.07 | 3.67 ± 0.08 |
| 155 | 3.47 ± 0.03 | 3.52 ± 0.06 |  | 3.76 ± 0.06 | 3.68 ± 0.10 |
| 162 | 3.45 ± 0.03 | 3.52 ± 0.06 |  | 3.79 ± 0.07 | 3.66 ± 0.12 |
| 169 | 3.51 ± 0.03 | 3.55 ± 0.05 |  | 3.77 ± 0.04 | 3.70 ± 0.08 |
| 176 | 3.46 ± 0.04 | 3.55 ± 0.05 |  | 3.77 ± 0.05 | 3.70 ± 0.10 |
| 183 | 3.58 ± 0.02 | 3.55 ± 0.08 |  | 3.89 ± 0.06 | 3.71 ± 0.11 |

Values are means ± SEM.

**Supplementary Table 4.** **Haematologic and blood biochemical profiles in rabbits.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Aspirate alone**  **(male)** | **UPAL gel**  **(male)** |  | **Aspirate alone (female)** | **UPAL gel (female)** |
| RBC (10000/μL) | 664 ± 17 | 644 ± 13 |  | 591 ± 13 | 564 ± 22 |
| HGB (g/dL) | 14.0 ± 0.3 | 13.7 ± 0.2 |  | 12.6 ± 0.2 | 12.0 ± 0.4 |
| Haematocrit (%) | 43.8 ± 0.8 | 43.5 ± 0.6 |  | 39.7 ± 0.8 | 37.8 ± 1.0 |
| Platelet (10000/μL) | 29.0 ± 0.02 | 5.6 ± 0.04 |  | 23.4 ± 1.8 | 27.9 ± 1.3 |
| PT (sec) | 8.9 ± 0.2 | 8.2 ± 0.4 |  | 9.5 ± 0.1 | 9.1 ± 0.4 |
| APTT (sec) | 10.9 ± 0.7 | 10.3 ± 0.2 |  | 12.6 ± 0.6 | 12.4 ± 0.2 |
| WBC (100/μL) | 85.8 ± 4.7 | 85.2 ± 3.1 |  | 70.3 ± 4.7 | 60.6 ± 5.7 |
| Neutrophil (%) | 26.9 ± 2.1 | 26.4 ± 2.3 |  | 29.4 ± 4.0 | 31.9 ± 4.5 |
| Eosinophil (%) | 1.9 ± 0.5 | 1.4 ± 0.2 |  | 1.3 ± 0.2 | 1.3 ± 0.2 |
| Basophil (%) | 5.3 ± 0.6 | 5.0 ± 0.3 |  | 7.1 ± 0.9 | 6.9 ± 0.7 |
| Monocyte (%) | 3.9 ± 0.04 | 3.9 ± 0.1 |  | 3.3 ± 0.4 | 2.9 ± 0.2 |
| Lymphocyte (%) | 62.0 ± 2.8 | 63.4 ± 2.7 |  | 59.0 ± 4.0 | 57.0 ± 3.8 |
| Total protein (g/dL) | 7.8 ± 0.04 | 7.6 ± 0.1 |  | 7.4 ± 0.2 | 7.3 ± 0.3 |
| Albumin (g/dL) | 5.4 ± 0.1\* | 5.2 ± 0.1\* |  | 5.1 ± 0.1 | 5.1 ± 0.2 |
| A/G | 2.33 ± 0.07 | 2.17 ± 0.10 |  | 2.33 ± 0.09 | 2.29 ± 0.07 |
| Glucose (mg/dL) | 158 ± 3\*\* | 132 ± 5\*\* |  | 136 ± 4 | 128 ± 5 |
| Total cholesterol (mg/dL) | 23 ± 1 | 21 ± 2 |  | 39 ± 3 | 35 ± 2 |
| Triglyceride (mg/dL) | 17 ± 1 | 16 ± 1 |  | 16 ± 2 | 17 ± 1 |
| Phospholipid (mg/dL) | 57 ± 1 | 53 ± 3 |  | 70 ± 4 | 65 ± 3 |
| AST (U/L) | 48 ± 14 | 39 ± 4 |  | 27 ± 4 | 26 ± 2 |
| ALT (U/L) | 84 ± 19 | 102 ± 14 |  | 58 ± 7 | 66 ± 6 |
| γGTP (U/L) | 6 ± 1 | 6 ± 1 |  | 4 ± 1 | 5 ± 0.4 |
| LDH (U/L) | 59 ± 10 | 48 ± 2 |  | 45 ± 5 | 77 ± 42 |
| BUN (mg/dL) | 22.0 ± 0.9 | 25.0 ± 1.6 |  | 25.0 ± 0.8 | 26.0 ± 2.0 |
| Creatinine (mg/dL) | 1.30 ± 0.04 | 1.30 ± 0.004 |  | 1.30 ± 0.04 | 1.40 ± 0.04 |
| Total bilirubin (mg/dL) | 0.02 ± 0.004 | 0.02 ± 0.004 |  | 0.02 ± 0.004 | 0.02 ± 0.004 |
| ALP (U/L) | 122 ± 8 | 115 ± 6 |  | 116 ± 9 | 128 ± 4 |
| Inorganic phosphorus (mg/dL) | 3.9 ± 0.2 | 3.7 ± 0.1 |  | 3.4 ± 0.2 | 3.5 ± 0.2 |
| Ca (mg/dL) | 14.1 ± 0.2\*\* | 13.2 ± 0.2\*\* |  | 13.3 ± 0.4 | 12.7 ± 0.5 |
| Na (mEq/L) | 147.6 ± 0.4 | 146.2 ± 1.1 |  | 142.4 ± 1.3 | 143.0 ± 1.4 |
| K (mEq/L) | 4.65 ± 0.105 | 4.83 ± 0.19 |  | 4.49 ± 0.10 | 4.33 ± 0.32 |
| Cl (mEq/L) | 112.0 ± 0.4 | 110.8 ± 0.9 |  | 109.5 ± 1.5 | 107.9 ± 0.8 |

Values are means ± SEM.

\*p<0.05 and \*\*p<0.01 between groups were considered significant.

**Supplementary Table 5. Urinalysis in rabbits.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Aspirate alone (male)** | **UPAL gel**  **(male)** |  | **Aspirate alone (female)** | **UPAL gel**  **(female)** |
| pH |  |  |  |  |  |
| 7.5 | 1 | 0 |  | 0 | 0 |
| 8 | 3 | 2 |  | 0 | 1 |
| 8.5 | 1 | 4 |  | 6 | 5 |
| Protein |  |  |  |  |  |
| - (negative) | 5 | 4 |  | 3 | 4 |
| ± (≤10 and <30 mg/dL) | 0 | 2 |  | 1 | 3 |
| + (<30 and <100 mg/dL) | 0 | 0 |  | 2 | 0 |
| Glucose |  |  |  |  |  |
| - (negative) | 5 | 6 |  | 6 | 6 |
| Ketone |  |  |  |  |  |
| - (negative) | 5 | 6 |  | 6 | 6 |
| Occult blood |  |  |  |  |  |
| - (negative) | 5 | 6 |  | 6 | 6 |
| Urobilinogen |  |  |  |  |  |
| ± (normal) | 5 | 4 |  | 4 | 6 |
| + (≤2.0 and <4.0 mg/dL) | 0 | 2 |  | 2 | 0 |
| Colour |  |  |  |  |  |
| Light yellow | 4 | 4 |  | 4 | 6 |
| Yellow | 1 | 2 |  | 2 | 0 |
| Turbidity |  |  |  |  |  |
| - (negative) | 0 | 1 |  | 0 | 0 |
| + (slight) | 0 | 1 |  | 1 | 0 |
| 2+ (moderate) | 0 | 0 |  | 1 | 0 |
| 3+ (marked) | 5 | 4 |  | 4 | 6 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Aspirate alone** | | | | | | | | |  | **UPAL gel** | | | | | | | | |
| **Organs** |  | **-** | **±** | **+** | **2+** | **3+** | **P** | **NE** | **%\*** |  | | **-** | **±** | **+** | **2+** | **3+** | **P** | **NE** | **%\*** | **P** |
| Brain |  | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 9.10 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.29 |
| Spinal cord |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Pituitary gland |  | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 9.10 |  | | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 8.33 | 0.95 |
| Eyeball |  | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 9.10 |  | | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 8.33 | 0.95 |
| Submandibular gland |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 8.33 | 0.33 |
| Oesophagus |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Trachea |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Aorta |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Thyroid gland |  | 8 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |  | | 10 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | NA |
| Parathyroid gland |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Thymus |  | 9 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |  | | 10 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | NA |
| Heart |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Lung |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 16.7 | 0.16 |
| Bronchus |  | 9 | 2 | 0 | 0 | 0 | 0 | 0 | 18.2 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.12 |
| Liver |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Gall bladder |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Kidney |  | 1 | 9 | 1 | 0 | 0 | 0 | 0 | 90.9 |  | | 4 | 6 | 2 | 0 | 0 | 0 | 0 | 66.7 | 0.16 |
| Spleen |  | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 100 |  | | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 100 | NA |
| Pancreas |  | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 9.10 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.29 |
| Adrenal gland |  | 7 | 0 | 0 | 0 | 0 | 4 | 0 | 0 |  | | 6 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | NA |
| Stomach |  | 8 | 3 | 0 | 0 | 0 | 0 | 0 | 27.3 |  | | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 8.33 | 0.23 |
| Duodenum |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Jejunum |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Ileum |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Caecum |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Colon |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Rectum |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Submandibular |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Mesenteric |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 8.33 | 0.33 |
| Testis |  | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 60 |  | | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 16.7 | 0.14 |
| Epididymis |  | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 16.7 | 0.34 |
| Prostate |  | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Seminal vesicle |  | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Ovary |  | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 16.7 |  | | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.25 |
| Uterus |  | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 16.7 | 0.34 |
| Vagina |  | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Urinary bladder |  | 2 | 8 | 1 | 0 | 0 | 0 | 0 | 81.8 |  | | 1 | 10 | 1 | 0 | 0 | 0 | 0 | 91.7 | 0.48 |
| Femur |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Marrow, femur |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Sternum |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Marrow, sternum |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Skeletal muscle |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Sciatic nerve |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Skin |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |
| Mammary gland |  | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |  | | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NA |

**Supplementary Table 6. Histologic grading of principal organs in rabbits.**

-: No abnormal changes, ±: Very slight, +: Slight, 2+: Moderate, 3+: Marked, P: Non-graded change, NE: Not examined, NA: Not applicable

\*: Percentage of incidence

**Supplementary Table 7. Histologic grading of implanted IVDs in rabbits.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Aspirate alone** | | | | | | | |  | | |  | | **UPAL gel** | | | | | | |  | |  |
| **Findings** |  | **-** | **±** | **+** | **2+** | **3+** | **P** | **NE** | **%\*** | |  | **-** | | **±** | | **+** | **2+** | **3+** | **P** | **NE** | **%\*** | | **P** | |
| 4 weeks |  |  |  |  |  |  |  |  |  | |  |  | |  | |  |  |  |  |  |  | |  | |
| Cell debris |  | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 100 | |  | 1 | | 11 | | 0 | 0 | 0 | 0 | 0 | 91.6 | | 0.31 | |
| Hyperplasia, collagen fibre |  | 0 | 6 | 6 | 0 | 0 | 0 | 0 | 100 | |  | 0 | | 3 | | 9 | 0 | 0 | 0 | 0 | 100 | | NA | |
| Proliferation, nucleus pulposus cell |  | 0 | 8 | 4 | 0 | 0 | 0 | 0 | 100 | |  | 1 | | 3 | | 8 | 0 | 0 | 0 | 0 | 91.7 | | 0.31 | |
| Rupture/crack, annulus fibrosus |  | 7 | 4 | 1 | 0 | 0 | 0 | 0 | 41.7 | |  | 11 | | 1 | | 0 | 0 | 0 | 0 | 0 | 8.33 | | 0.060 | |
| Thickening, vertebral extremity |  | 7 | 2 | 3 | 0 | 0 | 0 | 0 | 41.7 | |  | 10 | | 2 | | 0 | 0 | 0 | 0 | 0 | 16.7 | | 0.18 | |
| 26 weeks |  |  |  |  |  |  |  |  |  | |  |  | |  | |  |  |  |  |  |  | |  | |
| Cell debris |  | 4 | 17 | 1 | 0 | 0 | 0 | 0 | 81.8 | |  | 13 | | 10 | | 0 | 0 | 0 | 0 | 1 | 43.5 | | 0.17 | |
| Hyperplasia, collagen fibre |  | 10 | 12 | 0 | 0 | 0 | 0 | 0 | 54.5 | |  | 4 | | 18 | | 1 | 0 | 0 | 0 | 1 | 82.6 | | 0.13 | |
| Proliferation, nucleus pulposus cell |  | 8 | 13 | 1 | 0 | 0 | 0 | 0 | 63.6 | |  | 6 | | 17 | | 0 | 0 | 0 | 0 | 1 | 73.9 | | 0.48 | |
| Rupture/crack, annulus fibrosus |  | 14 | 2 | 6 | 0 | 0 | 0 | 0 | 36.4 | |  | 15 | | 5 | | 3 | 0 | 0 | 0 | 1 | 34.8 | | 0.99 | |
| Thickening, vertebral extremity |  | 18 | 2 | 2 | 0 | 0 | 0 | 0 | 18.2 | |  | 20 | | 2 | | 1 | 0 | 0 | 0 | 1 | 13.0 | | 0.86 | |

-: No abnormal changes, ±: Very slight, +: Slight, 2+: Moderate, 3+: Marked, P: Non-graded change, NE: Not examined, NA: Not applicable

\*: Percentage of incidence