WJ spans the entire length of the umbilical cord, located between the blood vessels of the umbilical cord. The various elements included in this study are of interest for cartilage engineering research. The tissues of interest include umbilical cord-derived Wharton's Jelly (WJ).

Methods and Materials

Human umbilical cords were obtained from consenting donors following full-term delivery. All methods were completed in compliance with the FDA and American Association of Tissue Banks (AATB) standards. The manufacture of the HCT/P does not involve the combination of the cells or tissues with another article, except for water, crystalloids, or a sterilizing, disinfecting, or preserving agent. The tissues, and Cellular and Tissue-Based Product Regulation). The manufacture of the HCT/P does not involve the combination of the cells or tissues with another article, except for water, crystalloids, or a sterilizing, disinfecting, or preserving agent. The tissues, and Cellular and Tissue-Based Product Regulation). The manufacture of the HCT/P does not involve the combination of the cells or tissues with another article, except for water, crystalloids, or a sterilizing, disinfecting, or preserving agent. All test results were negative or non-reactive. All methods were completed in compliance with the FDA and American Association of Tissue Banks (AATB) standards. The manufacture of the HCT/P does not involve the combination of the cells or tissues with another article, except for water, crystalloids, or a sterilizing, disinfecting, or preserving agent. All test results were negative or non-reactive.

Preparation of the Post-Processed Umbilical Cord Tissue Samples. The tissue samples were then examined on a ZEISS Supra 55VP Field-Emission Scanning Electron Microscope (SEM) at 500 and 1000 nm resolution scales.

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Discussion

In the current study, FF-allografts were processed through minimal manipulation of human umbilical cord tissue samples and are designed as potential cartilage repair tissues. The extracellular matrix found in cartilage and dermis. The breakdown of collagen (Figure 4C) results in the loss of tissue engineering potential, and new alternatives are needed. Perinatal birth tissue allografts are a novel frontier for bio-mechanical testing. The extracellular matrix of fetal dermal connective tissue is analogous to the extracellular matrix of cartilage (4.7).19 Previously published research illustrated that FF-allografts do demonstrate collagen preservation which could be beneficial in cartilage regeneration (15). The extracellular matrix remained undisturbed in the FF-allograft sections throughout the analysis. The combination of the cells or tissues with another article, except for water, crystalloids, or a sterilizing, disinfecting, or preserving agent. The tissues, and Cellular and Tissue-Based Product Regulation). The manufacture of the HCT/P does not involve the combination of the cells or tissues with another article, except for water, crystalloids, or a sterilizing, disinfecting, or preserving agent. All test results were negative or non-reactive.

Conclusions

Through microscopic imaging, the FF-allografts were shown to retain the inherent potential to be used as an architectural scaffold for ECM-buffering substitute in cartilage-based tissue structure and chondrocyte matrix repair. More testing is needed for processing structural characteristics. Further, the SEM images demonstrated comparable microstructural characteristics in post-processed FF samples and ECM in vitro and in vivo applications. The planar collagen characteristics are consistent between both tissue types, supporting homologous use.

Future Directions

In summary, we intend to expand our research to further confirm the mechanical comparison between human umbilical cord tissue allografts, skeletal muscle, and cartilage. This approach would be coupled with high resolution confocal and fluorescence microscopy imaging to determine if the biocompatible/homologous matrix of the FF-allograft is capable of allowing for differentiation between the different types of collagens in the extracellular matrix. Future case studies documenting animal and cartilage tissue allografts will be with cartilage engineering research. The tissues of interest include umbilical cord-derived Wharton's Jelly (WJ).