Evaluation of hyaluronan content in areas of densification compared to adjacent areas of fascia

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Background

Connective tissues between fascia layers are rich in hyaluronan (HA), allowing normal gliding of fascial layers. Fascial densifications contain increased concentration of HA molecules, leading to aggregation of HA chains and altered HA consistency. Restricted fascial gliding, dysfunction and pain may follow. Centers of coordination (CC) are specific points where forces of muscle contraction converge in epimysial fascia to coordinate joint movement.

This study compared HA content at a densified CC to adjacent non-densified areas and looked for visible differences between CC and non-CC sites through histological staining techniques.

Methods

A CC in the tensor fasciae latae was identified on an embalmed human cadaver. A densification was identified at the CC by palpation before dissection. Non-densified muscle and fascia was dissected 2 cm away from the palpated density. Sectioned tissues were stained with Hematoxylin and Eosin. Serial sections were stained with Colloidal Iron, both treated and untreated with hyaluronidase, and Alcian Blue.

Results

Compared to similar adjacent tissue, increased HA was confirmed at the densified CC (Fig. 1). The concentration of positive staining decreased away from the densification site (Fig. 2). Dense blue staining was absent post-digestion with hyaluronidase (Fig. 3). This confirmed that the areas of positive staining material were HA. Sections from non-densified tissue demonstrated minimal HA content when compared to the palpated densifications (Fig. 4).

Conclusion

HA is demonstrated by both Colloidal Iron and Alcian Blue stains, confirmed by lack of staining after treatment with hyaluronidase. This visual method indicated high concentration of HA at the CC that decreased away from the site.

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