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## ABSTRACT

The rate of biodegradation of two commercially available hemostatic collagen fibers, i.e., collagen fleece (Novacol) and microfibrillar collagen (Avitene) were studied by biochemical and morphologic methods. Urinary excretion of hydroxyproline as an index of collagen degradation was studied in 10 six-month-old rats after s.c. implantation of 2 g of either material during 15 postimplantation sampling periods for a total of 64 days. It was found that collagen fleece degraded significantly faster than microfibrillar collagen, 50% of implanted collagen fleece being resorbed within 8.5 days as compared to 18.8 days for microfibrillar collagen.

Morphological evaluation of the resorption and corresponding tissue reaction was done in two groups of 6 male Sprague Dawley adult rats surgically implanted subcutaneously, intramuscularly, intrahepatically, intrasplenically and intrarenally with 3 mg samples of collagen fleece or microfibrillar collagen at multiple implantation sites. One animal from each group was sacrificed and samples were obtained at 7, 14, 28 days and at 2 months.

Both types of fibrillar collagen implants induced cellular reaction, with faster ingrowth of cells around and into the collagen fleece implant. With microfibrillar collagen the reaction is delayed and lasts for a longer period of time. Soon after tissue implantation of collagen fleece the implants cannot be identified by the naked eye due to its gelling. Only morphological analysis indicates the magnitude of the resorption of collagen fleece. While collagen fleece was not detected in four week specimens of either tissue, microfibrillar collagen was still present as an encapsulated depot at two months. The differing dynamics of the biodegradation of these two collagen fiber materials are the reflection of structural stability of their molecules.



