

OBSERVATIONS

Awaiting Autoamputation: A Primary Management Strategy for Toe Gangrene in Diabetic Foot Disease

We have offered subjects with diabetes and toe gangrene in whom initial antibiotic treatment of associated infection has resulted in a well-demarcated, dry gangrenous digit, the choice of surgical amputation or awaiting autoamputation. We performed a retrospective cohort study to assess the effectiveness of the strategy of awaiting autoamputation by assessing subjects presenting to the multidisciplinary diabetes foot clinic between February 2007 and February 2010 in whom this was the primary management strategy. Mann-Whitney and Fisher exact tests were used for comparisons between groups.

We identified 11 such subjects: 7 (64%) were male, 4 (36%) had type 1 diabetes, and median (interquartile range) HbA_{1c} was 8.3% (8.1–8.7). Age and duration of diabetes were bimodally distributed: 41.5 (38.5–48) and 34 (32.5–36) years for those with type 1 diabetes and 69 (50–79) and 15 (15–30) years, respectively, for those with type 2 diabetes. All had peripheral neuropathy and retinopathy. Nine (82%) had end-stage renal failure—4 on hemodialysis and 5 with renal transplants. Ten subjects had one and 1 subject had four gangrenous toes. The distal part of a toe was affected in 4 subjects, and one or more whole toes were affected in 7 subjects. In all, arterial duplex imaging with or without subsequent digital subtraction angiography failed to identify potential target lesions for vascular surgical intervention.

Successful autoamputation occurred in six subjects (55%). In one, minor trauma

caused the residual necrotic tissue to snap off, resulting in successful autoamputation; in none was it necessary to resect denuded protruberant bone. Median (interquartile range) time to autoamputation was 5 (2–6) months. Nine had subsequent infections requiring further antibiotics, and four failed to respond and required surgical amputation (two Ray and two transmetatarsal). Time to surgical amputation was 4.5 (3–6.5) months. Two subjects died—one after successful Ray amputation and another while awaiting autoamputation, both from coronary heart disease considered unrelated to their foot pathology. Significant pain occurred in three subjects: one proceeded to successful autoamputation and two to surgical amputation for infection. Age, duration of diabetes, sex, type of diabetes, proportion with end-stage renal failure, proportion on immunosuppressant therapy, HbA_{1c}, and the proportion with only the distal part of a toe necrotic were not statistically significantly different in those that achieved successful autoamputation.

Aside from two case reports (1,2), this is the first description of a cohort of subjects in whom autoamputation was assessed as the primary management strategy for toe gangrene. Of note, 82% required renal replacement therapy; digital gangrene is recognized in end-stage renal disease, but reports tend to involve fingers (3). A previous report suggested that acute septic vasculitis is an important etiological factor (4). The four subjects in whom the strategy failed may have had higher level amputations than would have been necessary if surgical amputation had been the primary interventional strategy. However, minor surgical amputation as a primary management strategy can also result in failure to heal and a higher level amputation, particularly in the absence of revascularization options. A randomized controlled trial comparing the two strategies is required.

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