In order to prevent aspiration following loss of function of the UOS a new sphincter may develop. This usually arises from the oblique part of the cricopharyngeus muscle and the caudal part of the thyropharyngeus muscle and it is functionally independent of the UOS. We examined 40 patients by cinematography: these included 30 patients with a Zenker's diverticulum, 8 patients following myotomy of the UOS and 2 patients with tumour infiltration of the UOS. The new sphincter could be demonstrated in 70% of patients with Zenker's diverticulum: its function depended on the size and localisation of the diverticulum. Following myotomy of the UOS the new sphincter is usually only just perceptible. In one case there was, however, marked dyskinesia, requiring further myotomy.