Crowding is the breakdown in object recognition that occurs in cluttered visual environments. Despite being the principal restriction on perception in the peripheral visual field, its cortical locus remains unclear. Greenwood et al. (2010, Current Biology, 20(6):496-501) recently demonstrated that crowding changes the appearance of objects, such that a crowded patch of noise, surrounded by oriented Gabor flankers, becomes perceptually oriented to match the flankers. Under such conditions, substituting the noise patch for an oriented Gabor (identical to the flankers) goes unnoticed. Here, we combined an event-related fMRI adaptation paradigm with a change-detection task to determine the neural correlates of the crowded percept. Observers monocularly viewed a peripheral noise patch surrounded by four Gabors. After 500ms the noise either remained unchanged (no-change), or was substituted for a Gabor that either matched (same-change) or was orthogonal to the flankers (different-change). Observers rarely detected the substitution of a perceptually matched Gabor (same-change), but nearly always detected the substitution of an orthogonal Gabor (different-change). We predicted that cortical areas reflecting the crowded percept would show repetition-suppression on trials where the noise was substituted for a perceptually matched Gabor (i.e. same-change condition but no-change perceived), and the fMRI response would be indistinguishable from that for the no-change trials. In contrast, we predicted release from adaptation when the noise was substituted for a perceptually orthogonal Gabor (different-change). This predicted pattern of activation was observed in early retinotopic cortex, weak in V1 compared to later visual areas (V2-V4). Our findings suggest that the perceptual consequences of crowding are manifest in early visual areas, in particular those upstream from V1.