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We report the use of Gamma knife radiosurgery (GK) to 15 somatotroph adenomas. Eight patients had refractory acromegaly despite maximal conventional treatments: all had undergone conventional radiotherapy (CRT), mean interval between CRT and GK 15.6 years. Six had undergone surgery, two on more than one occasion. Five were receiving somatostatin analog therapy, one was receiving dopamine agonist therapy, one was on pegvisomant alone. All had radiologically defined disease, well clear of the chiasm.

Normalisation of serum IGF-I levels was achieved in 7/8 patients (87.5%), with normalisation of both mean growth hormone (GH<5 mU/l) and serum IGF-1 in 3/8 (37%), mean follow up 24.1 months (range 3–60). Mean GH fell by 40% at 1 and 51% at 2 years.

About 5/8 were panhypopituitary prior to GK. Two of the remaining three have lost further anterior pituitary function subsequently. However, there was no evidence of any other adverse events: no visual field or acuity loss, no new tumours within the radiotherapy field, and no other neurological or psychological sequelae.

We have also treated 7 patients who had undergone surgery but no CRT. So far we have achieved normal serum GH and IGF-I in 57%, and a 60.5% reduction in mean GH (mean follow up 32 months). Mean GH fell by 51% at 1, and 65% at 2 years. No adverse effects were detected.

Presenting serum GH level was an independent predictor of cure. About 85% of those with mean GH<10 mU/l at the time of GK, achieved normalisation of GH within 2 years, irrespective of previous treatment or time since diagnosis.

These data indicate that GK is a highly effective, and extremely safe adjunctive treatment for patients not cured with surgery and conventional radiotherapy. Our findings also indicate that GK is a safe alternative to CRT, and is particularly effective in biochemically mild disease.