

between circulating VEGF and VEGF-C levels and tumor aggressiveness, and considered their potential role in predicting metastases in patients with PTC.

In this prospective study, researchers measured the serum VEGF and VEGF-C levels of 85 patients with PTC (mean age 50 years) and of 44 control individuals (mean age 52 years) with benign thyroid disease, who all underwent elective thyroidectomy within 24 h afterwards.

Patients with primary PTC had significantly higher preoperative levels of serum VEGF and VEGF-C than controls. Preoperative VEGF-C, but not VEGF, levels were significantly elevated in patients >45 years of age, patients with extrathyroidal extension and those with lymph-node metastases. Elevated preoperative VEGF-C levels also significantly correlated with advanced tumor stages and with an increased incidence of nodal metastases. After multivariate analysis, the serum concentration of VEGF-C was the only independent risk factor for lymph-node metastases.

The authors suggest that the potential clinical applications of serum VEGF-C measurements, for example to predict tumor prognosis, diagnose nodal metastases and to guide management strategies, should be further evaluated.

**Original article** Yu X-M *et al.* (2008) Serum vascular endothelial growth factor C correlates with lymph node metastases and high-risk tumor profiles in papillary thyroid carcinoma. *Ann Surg* 247: 483–489

### New predictive model for complete resolution of hypertension after adrenalectomy

Primary aldosteronism is commonly caused by an aldosterone-producing adenoma (APA). The primary role of adrenalectomy in the treatment of APA is to correct hypokalemia and improve blood pressure control. Although hypertension improves in >90% of patients after adrenalectomy, many continue to require antihypertensive medication. To help clinicians predict whether patients with APA who undergo adrenalectomy are likely to experience complete resolution of their hypertension, Zarnegar *et al.* developed and validated a prediction model based on data that are readily available to practicing clinicians.

The researchers identified clinical variables associated with the resolution of hypertension

by examining data on 100 patients who underwent adrenalectomy for APA at a US tertiary referral center. This dataset was used to construct a multivariate prediction model and the predictive scores were validated in an independent dataset of 67 patients from another tertiary medical center in the US.

The best predictive model for complete resolution of hypertension after adrenalectomy used four variables (two or fewer antihypertensive medications, BMI  $\leq 25$  kg/m<sup>2</sup>, duration of hypertension  $\leq 6$  years, female sex). The resulting aldosteronoma-resolution score (ARS) identified three levels of likelihood (low, medium, high) for complete resolution of hypertension. A low ARS had a negative predictive value of 72.4%, whereas a high ARS had a positive predictive value of 75.0%.

The authors conclude that the ARS can help clinicians objectively inform patients about potential treatment outcomes before they undergo surgery.

**Original article** Zarnegar R *et al.* (2008) The aldosteronoma resolution score: predicting complete resolution of hypertension after adrenalectomy for aldosteronoma. *Ann Surg* 247: 511–518

### Development of hyperandrogenemia in women receiving pulsatile GnRH therapy

Hyperandrogenemia is the most common cause of ovarian failure; however, unfortunately, the etiology of this disorder remains elusive. The onset of hyperandrogenemia is often at or shortly after puberty, which suggests that disease development might be linked to the gonadotropic stimulation of the ovaries that begins at this time. An observational study by Mattle *et al.* provides support for the notion that an abnormal ovarian or pituitary response to gonadotropin-releasing hormone (GnRH) underlies hyperandrogenemia.

The authors observed that 6 of 120 women with hypothalamic amenorrhea who were treated with pulsatile GnRH therapy for up to 140 days to induce ovulation developed hyperandrogenemia and polycystic ovaries. These six patients (age range 25–35 years), who all had BMIs in the low to normal range, initially responded normally to the therapy with ovulation and corpus luteum formation. However, hyperandrogenemia developed in all six within a few cycles, as indicated by a rise in testosterone, an increase in the luteinizing