**Background and purpose**

Increased vascularity is the hallmark of malignancy in focal intra-testicular abnormalities. Colour Doppler ultrasound assessment is reported of limited use in lesions <16mm. We assessed the capability of colour Doppler in focal testicular abnormalities, to ascertain lesion volume that allows confident lesion vascularisation.

**Methods**

A departmental database identified 135 focal testicular lesions (in 100 patients) examined by a single observer, over a 10 year period, using an Acuson Sequoia 512 and a 15MHz transducer. Examinations were performed with Grey scale and colour Doppler images and video clips recorded. Images were retrospectively reviewed; size/volume, grey-scale features (echogenicity/calcification/ border configuration/cystic change), colour Doppler appearances (presence/absence) and distribution of vessels (linear/criss-cross) for each lesion. All lesions had histological diagnosis.

**Results**

Mean age was 37 years (range 1-76 years). Mean lesion volume was 8mls (range 0.004 – 142mls). Histology was: seminoma (n=54), non-seminomatous germ cell tumour (GCT) or mixed GCT (n=35), malignant non GCT or metastases (n=9), benign non GCT (Leydig cell tumour/hyperplasia) (n=16), ischaemic/inflammatory, post inflammatory/infective lesions or fibrosis (n=21). 50/54 seminomas (93%) showed increased vascularity, with criss-crossing intra-lesional vessels; 3/54 (5%) were hypovascular. One lesion was isovascular to normal testis. No relationship between the size and vascularity was demonstrated.

Non-seminomatous/mixed GCTs demonstrated a variety of vascular patterns; 29/35 (83%) showed increased vascularity, either criss-crossing or disorganised. No relationship was seen between size and vascularity.

Nine focal lesions represented ischaemia and/or infarction or fibrosis. All were avascular. Cystic lesions and abscesses were avascular.

**Conclusion**

Increased vascularity, with criss-crossing intra-lesional vessels, was demonstrated in 93% of seminomas, and in 90% of mixed GCTs with a seminomatous component. 85% of malignant lesions demonstrated increased vascularity. Vascularity was demonstrated in lesions of all sizes. The absence of internal vascularity, in conjunction with typical B-mode findings, correctly prospectively identified benign ischaemic, fibrotic and cystic lesions.