The researchers compared French Canadian individuals, who were treated for superficial bladder cancer, with matched controls. They evaluated 37 patients who remained recurrence-free after a median of 7.6 years, 67 patients considered to be at high risk of recurrence, and 109 controls. Decobert *et al.* assessed five polymorphisms of *SLC11A1*, of which two were associated with survival: all eight patients with the most rapid recurrence (within 6 months after BCG treatment) had a single base-pair change causing an Asp543Asn amino-acid substitution. These patients were also homozygous for the STRONG *SLC11A1* PROMOTER. The best outcomes were seen in patients who were likewise homozygous for the strong *SLC11A1* promoter, but also homozygous for wild-type NRAMP1 protein. Weaker associations were seen in heterozygous individuals, although the effect of mutated NRAMP1 protein far outweighed that of promoter strength, suggesting that an effective response to BCG requires wild-type NRAMP1 in large amounts. Interestingly, individuals homozygous for the strong *SLC11A1* promoter are known to produce high levels of tumor necrosis factor, which drives the proinflammatory response to infection.

Caroline Barranco

Original article Decobert M *et al.* (2006) Polymorphisms of the human *NRAMP1* gene are associated with response to bacillus Calmette–Guérin immunotherapy for superficial bladder cancer. *J Urol* 175: 1506–1511

Cystoplasty using tissue-engineered bladders

A recent article in *The Lancet* reports that tissue-engineered human bladders have been successfully implanted in patients with end-stage bladder disease.

For the past century, the gold-standard treatment for patients needing reconstructive bladder surgery has been cystoplasty, using gastrointestinal segments to augment the native bladder, but this procedure carries with it inherent complications, including metabolic disturbances, mucus secretion, and an increased risk of kidney stones and cancer.

Atala and colleagues have been investigating alternative approaches using bioengineering and, following successful experiments in dogs, have engineered human bladder tissue

by seeding autologous urothelial and muscle cells on biodegradable, 3D matrices.

Bladder biopsies were taken from seven patients aged between 4 and 19 years with MYELOMENINGOCELE, and the cells were grown in bladder-shaped scaffolds made from either collagen ($n=4$) or a composite of collagen and polyglycolic acid, a biodegradable material used for hernia repair ($n=3$). After 7–8 weeks, the engineered bladder tissue was anastomosed to the native bladder. An OMENTUM wrap was applied to the implants in all patients with the composite scaffold and in one with the collagen scaffold. Patients were followed up for a mean of 46 months (range 22–61 months).

The improvements seen in bladder compliance and capacity were similar to those expected with traditional cystoplasty, but without the associated complications. The most impressive improvements were achieved using the composite scaffold with omentum wrap.

This study shows that tissue-engineered bladders can be implanted in patients with promising preliminary results, although further studies are required before this procedure can replace traditional cystoplasty.

Tamsin Osborne

Original article Atala A *et al.* (2006) Tissue-engineered autologous bladders for patients needing cystoplasty. *Lancet* 367: 1241–1246

Severe hydronephrosis—an indication for ureteroscopic lithotripsy?

The cost-effectiveness of shock-wave lithotripsy and ureteroscopic lithotripsy are comparable in patients with large, upper ureteral stones, a Taiwan-based group has found. Interestingly, this finding differs from those of previous studies in patients with distal ureteral stones; the authors attribute this difference to variation in patient characteristics and advances in ureteroscopic technology. Lee *et al.* suggest that an appreciation of the cost-effectiveness and success rate of different treatments, as well as patient factors including postoperative pain and satisfaction, are essential for optimizing the management of patients with large, upper ureteral stones.

Their prospective, randomized trial enrolled 42 patients who had a single stone ≥ 15 mm in diameter in the upper third of the ureter; 22 patients were randomly allocated to shock-wave

GLOSSARY

STRONG *SLC11A1* PROMOTER

Allele 3 of the *SLC11A1* promoter results in high expression of natural resistance-associated macrophage protein 1, at 5–8-fold higher levels than achieved by alleles 1, 2 and 4

MYELOMENINGOCELE

A congenital condition in which the neural arches fail to close, resulting in a poorly compliant bladder

OMENTUM

A sheet of fat with a rich blood supply attached to the stomach, commonly used in reconstructive surgery to enhance vascularization of grafts