

Clear information for patients

Robotic surgery is also called robotic-assisted surgery.

This guide explains what it is, who it is for, and what to expect before and after your operation.

About robot-assisted surgery

Robotic (da Vinci) surgery is a minimally invasive keyhole technique that allows the surgeon to operate through small incisions using an advanced robotic system. In robotic-assisted surgery, the surgeon controls the robotic instruments to perform the procedure with enhanced precision, flexibility, and control. This technology enables the surgeon to perform very precise movements and carry out procedures ranging from simple to more complex operations while using small cuts.

The da Vinci surgical system uses robotic arms that hold specialised surgical instruments to assist the surgeon during the procedure. One robotic arm carries a high-definition 3D camera that provides a stable, magnified view of the surgical area.

Using hand controllers at the console, the surgeon precisely moves the other robotic arms and their instruments to perform each step of the operation. Importantly, the robotic system does not replace the surgeon – every movement of the robot is fully controlled by the operating surgeon.

In traditional laparoscopic surgery, the surgeon holds the tools in their own hands whilst in robot-assisted surgery, the tools are attached to the robot with full tremor-free control by the surgeon.

About robotic-assisted surgery by Mr Liao

- **Expert in robotic and laparoscopic HPB surgery**
- **Focus on day-case pathways where appropriate**
- **Personalised, patient-centred surgical care**

Mr Liao is a Consultant hepatopancreatobiliary (HPB) surgeon based in Cambridge, specialising in robotic-assisted procedures involving the liver, pancreas, and gallbladder. He is recognised as one of the most experienced high-volume robotic surgeons in the East of England.

He played a leading role in establishing the multispecialty robotic surgery programme at Addenbrooke's Hospital in Cambridge, as well as developing robotic surgery services in the private sector at Spire Cambridge Lea Hospital. Mr Liao currently chairs the Robotic Surgery Medical Advisory Committee at Spire Cambridge Lea Hospital, which houses the first da Vinci robotic surgery system in the private sector in the East of England.



What does robotic surgery (specifically robotic-assisted cholecystectomy) involve?

Mr Liao uses the da Vinci robotic surgical platform to perform robotic-assisted gallbladder removal (robotic cholecystectomy). This technology brings an advanced level of precision and control to keyhole gallbladder surgery.

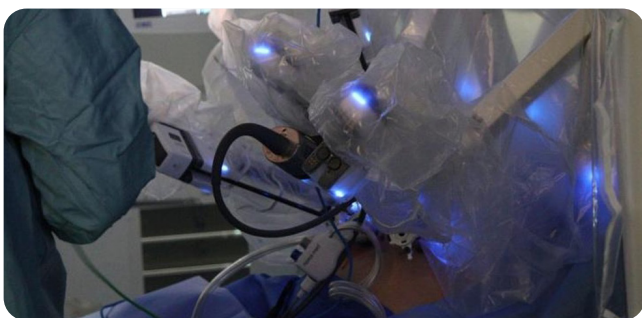
With extensive experience performing a high volume of these procedures, Mr Liao uses the da Vinci robot to treat a wide range of gallbladder conditions. This includes cases of moderate complexity, while still maintaining a minimally invasive keyhole surgical approach.



Mr Liao on the surgeon's console driving the da Vinci system. It is still your surgeon operating; the robot does not work on its own. The robotic system translates the surgeon's hand movements into very precise actions inside your body.



Patient console of the da Vinci system 'docked' during the surgery – this patient console is linked by a cable to the surgeon's console where the surgeon will be operating from. Robotic-assisted surgery is truly a team effort with Mr Liao working collaboratively and seamlessly with the anaesthetist and his team of assistants (surgical care practitioner and scrub nurse) at the patient side.



The robotic patient console has four robotic arms, allowing the surgeon to assign specific functions to each arm. This enables highly precise control and coordination, turning the procedure into a well-orchestrated surgical "symphony".



Mr Liao at the robotic surgeon's console (located a few feet away from the patient and the scrub team in the same operating room), which serves as the 'command centre' for the surgery.

Precision of robotic surgery

Compared with standard laparoscopy, robotic instruments can articulate and rotate like a human wrist. This allows surgeons to accomplish surgical steps that previously was not easy or possible with conventional techniques. The 3D camera magnifies the view, helping with accuracy around delicate structures in the liver, pancreas and gallbladder.



Potential benefits for robotic-assisted gallbladder surgery

Compared to traditional open surgery:

Smaller cuts

Keyhole incisions may mean less pain, smaller scars and a quicker recovery.

Precision & control

Wristed instruments and a magnified 3D view help accuracy around vessels and ducts. Potentially reduced blood loss due to the precision.

Faster return to life

Many patients go home sooner and return to normal activities earlier than with open surgery.

Compared to laparoscopic surgery:

Less pain

Compared with traditional laparoscopy, robotic instruments require less space to operate. This reduces the need to push tissues and organs aside and places less tension on the body wall, which may result in less pain for the patient.

Lower risk of open surgery

Robotic surgery significantly lowers the rate of conversion to open surgery. This avoids patients having surgery with a large wound (open surgery) especially when there is incidental or unexpected increased complexity to the surgery.

Advantages to the surgeon & patient

Robotic-assisted surgery enables the surgeon to have a greater range of motion than the human hand, with instruments that can articulate and rotate in tight spaces in ways that would otherwise not be possible. The highly stable, magnified 3D view provides the surgeon with an unparalleled view of the surgical field, allowing precise identification of tissues and structures and helping to avoid injury during surgery.

Risks & considerations

All surgical procedures, including robotic-assisted surgery, carry potential risks that may be related to the procedure itself or to individual patient factors. Mr Liau will discuss your specific risks and answer any questions during your clinic consultation before you make a decision about surgery. For full details, please refer to the Robotic Cholecystectomy Consent Form

Your robotic-assisted surgery journey

1

Consultation

Mr Liao will review your symptoms, scan results and blood tests (to ensure accurate diagnosis & assess complexity of condition), discuss options, benefits, and risks, and agree a plan.

2

Before your surgery

Pre-assessment checks, medicines review, and fasting guidance.

3

Day of surgery

Key-hole incisions, robotic assistance, and careful monitoring. Most operations take a few hours.

4

Recovery

Pain relief, early mobilisation, clot prevention prophylaxis (if appropriate) and a tailored discharge plan (including antibiotic if required).

Frequently asked questions about robotic surgery

Is the robot operating on its own?

Robotic surgery is performed by the surgeon, who controls the system, with the robotic arms functioning almost as an extension of the surgeon's hands.

Is robotic surgery safe?

Robotic systems are complex pieces of equipment, and the safety of the procedure depends on a well-trained surgical team. This includes a surgeon who has in-depth specialist experience in the procedure and has undergone rigorous, stepwise training to operate the system safely and effectively.

Do surgeons need specialized training to do robot-assisted surgery?

Yes. Surgeons must undergo additional structured, stepwise training before they are able to perform robotic surgery safely. Mr Liao has completed extensive training in this field, including training visits to the Netherlands, Belgium, South Korea and Canada.

Will I have scars and will it be painful?

Instead of making one large incision, the surgeon makes a few small incisions (usually four or five "bullet holes") for the robotic instruments. Compared with traditional laparoscopy, robotic instruments require less space to operate. This reduces the need to push tissues and organs aside and places less tension on the body wall, which may result in less pain for the patient.



How long will I stay in hospital?

For robotic-assisted cholecystectomy, most patients are able to return home on the same day as their surgery. Patients can usually get out of bed once they have recovered from the anaesthesia and are able to resume eating within a few hours after the procedure.

Before discharge, the ward nursing staff will provide you with instructions for care at home. Please refer to the 'Guide to Recovering from Gallbladder Surgery' for more information.

Can every operation be performed robotically?

No. Your surgeon will determine whether you are a suitable candidate for robotic-assisted surgery. This decision depends on several factors, including the planned procedure, your surgical history, the condition requiring treatment, the shape of your abdomen, and the experience of your surgeon.

