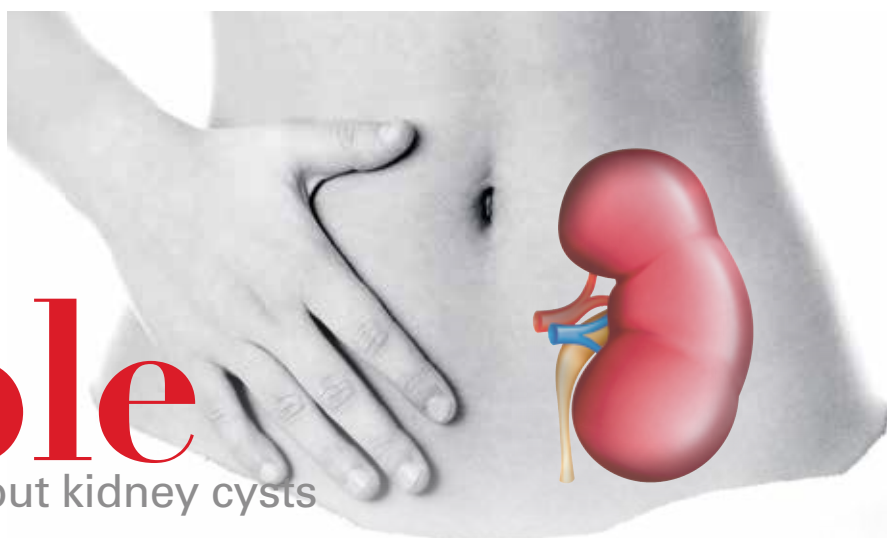


## Bubble Trouble

What you need to know about kidney cysts

by Dr Gerald Tan



**KIDNEY CYSTS ARE** fluid-filled collections that arise either on the surface of the kidney, or within the kidney tissue itself.

### What problems can kidney cysts cause?

The vast majority of kidney cysts actually do not cause any symptoms. These may be observed safely over a period of time for any change in their constitution. The problems that such cysts may cause include progressive increase in size, causing aches and pain over the affected loin; infection, which may present as loin pain, fever, and chills; progressive loss of kidney function; and risk of cancerous change.

### How do I know if my kidney cyst is likely to be cancerous?

Over the past 15 years, the management of kidney cysts has been based on the patient's Bosniak classification score<sup>1</sup> (named after radiologist Morton Bosniak from New York University), which stratifies the risk of cancerous change within the involved kidney cyst based on their radiographic features on computer tomography imaging with intravenous contrast (Figure 1):

- Bosniak 1 cyst – <1% risk of cancer, does not require follow-up
- Bosniak 2 cyst – <5% risk of cancer, does not require follow-up
- Bosniak 2F cyst – 5% risk of cancer, requires follow-up imaging to assess progress
- Bosniak 3 cyst – 50% risk of cancer, should be surgically removed or biopsied
- Bosniak 4 cyst – 80%–95% risk of cancer, should be surgically removed

### Bosniak classification of renal cysts

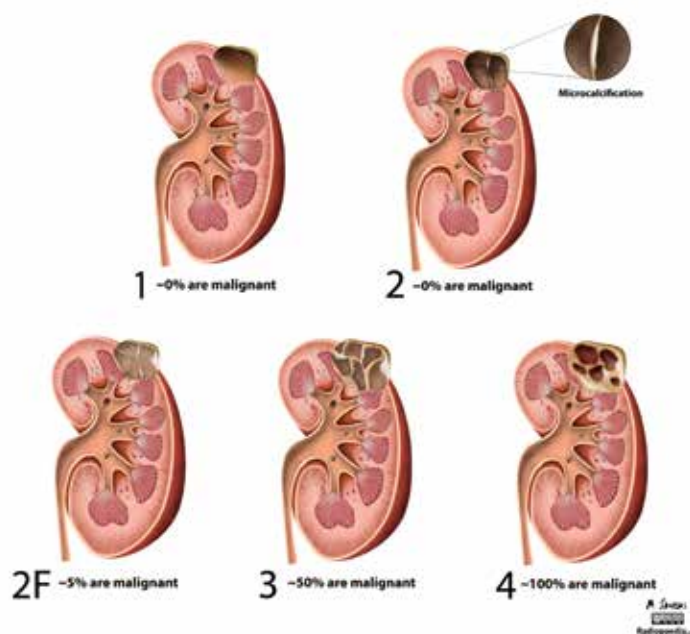


Figure 1: Bosniak classification of kidney cysts, based on their radiographic features on CT imaging of the kidney

### My doctor says I have a Bosniak 3 or 4 kidney cyst, and I should have it removed. How is the surgery performed?

Given the 50% to 90% risk of cancerous involvement in Bosniak 3 to 4 kidney cysts, it is best to have these removed surgically. Nowadays, most urologists would recommend a kidney-sparing approach (known as partial nephrectomy) toward excision of such potentially cancerous cysts that are

## Patient Story

Mr Raymond Yeoh, 37 years old

### How did you find out that you had a likely cancerous cyst in your kidney?

#### Did you have any symptoms?

**Mr Yeoh:** I had undergone a comprehensive health screening exercise that detected the anomaly through the ultrasound scan, which I followed up with a more comprehensive magnetic resonance imaging (MRI) scan in the abdomen area. As I exhibited no related symptoms and at 36 years of age, I felt confident prior to my first consult that it was going to be benign and would simply 'clear' itself up over time. My optimism, while not misplaced, was indeed misguided. When I was told that it was a Bosniak 4 cyst, I failed to grasp the nuances of my condition. Probably it was cancer, but as it was not a certainty, I struggled with the decision to proceed with open surgery.

### What treatment was proposed by your doctor, and which treatment did you eventually choose?

**Mr Yeoh:** Dr Gerald Tan was not my first doctor, but I am very thankful he subsequently became my attending physician. He exhibited a good grasp of the issues at hand and was very patient in explaining the various options available for treatment. He adequately addressed the ramifications of the different methods. He even prepared slides to show me his explanations. It was comforting. In the end, I opted for the Robotic-Assisted Laparoscopic Partial Nephrectomy (RALPN), which to my knowledge is not readily offered in every hospital. I had chosen it on the premise that I could save a large part of my kidney, and the recovery post-surgery was going to be quicker barring any severe complications.

### Can you share with us your experience with robotic kidney-sparing surgery?

#### How long were you in hospital?

**Mr Yeoh:** If this is a viable treatment for your condition, go for it! It is minimally invasive and far less damaging to your tissue wounds. My recovery rate was quick, and I was discharged after a three-night hospital stay. The immediate sensations after waking from surgery was just general discomfort and overall weakness, but I attributed that mostly to the general anesthesia. There were no specific sharp pangs of pain that I could recall, although you tend to be more wary. Sleep and rest were vital within the 24-hours post-surgery, but thereafter I could tell my body was recovering stronger as the hours passed. The next 24 hours allowed me to get back on my feet, and I had progressed onto a soft diet for my meals. It was also assuring that Dr Gerald reviewed me periodically and aptly described my recovery process.

### Your final laboratory report confirmed that the cyst was indeed early kidney cancer.

#### How did you feel when you received this news?

**Mr Yeoh:** At that very moment, I took a deep breath and was in two minds really – perhaps to calm myself for knowing with certainty that I was dealing with cancer and perhaps a sigh of relief that the recent RALPN was successful. In the days to come, I viewed the news distinctly positive as this was the best possible outcome one could possibly hope for, i.e. early detection and complete excision. If I had delayed, most likely the prognosis wouldn't have been as favourable. I am very thankful my life has been extended, and the anguish I put my loved ones through was warranted.

less than 4cm in size. In this surgery, the affected segment of kidney is removed with a 1cm margin of normal tissue, preserving the rest of the unaffected kidney. Surgical removal of such Stage 1 kidney cancers, while sparing the rest of the unaffected kidney, has now been established as the current international standard of care advocated by the European Association of Urology and American Urological Association.<sup>2,3</sup> Nephron-sparing surgery (NSS) is now preferred to radical nephrectomy, where the entire kidney is removed. Several large-scale studies have found that patients who undergo nephron-sparing surgery live longer and have a significantly lower risk of developing hypertension, ischaemic heart disease, or strokes over the long-term compared to patients who had their entire kidney removed.<sup>4</sup>

NSS may be performed through three approaches: (1) traditional open surgery, which involves a 15cm to 20cm incision in the abdomen or flank; (2) laparoscopic surgery, which is performed through small incisions in the abdomen; or (3) robotic surgery, using the da Vinci<sup>®</sup> surgical robot to remove the tumour and sew up the resulting defect in the affected kidney. Minimally invasive surgery, with or without robotic instrumentation, offers many advantages over traditional open surgery – small incisions result in significantly less pain, much quicker recovery, shorter hospital stays, and earlier return to daily activities. For open surgery, many patients complain of chronic pain or numbness over the large incision (Figure 2).



Figure 2(a): Patient with conventional open kidney surgery scar.  
Figure 2(b): Patient with minimally invasive nephron-sparing surgery scar

## My doctor says I have several cysts in both my kidneys. Does this mean that my kidneys will start to fail in future?

The presence of multiple cysts in both kidneys may be due to certain genetic conditions, such as autosomal dominant polycystic kidney disease (usually diagnosed in adulthood); autosomal recessive polycystic kidney disease (usually diagnosed in infancy and childhood); and medullary sponge kidney. In such conditions, healthy kidney tissue is gradually replaced with non-functioning cystic collections, resulting in progressive loss of kidney excretory function (Figure 3). Such patients should have their kidney function closely monitored and optimised by their nephrologists, although end-stage kidney failure requiring eventual dialysis or kidney transplant is a real possibility.

## My kidney cysts have been getting progressively larger and more painful. What treatment options are available?

There are several approaches to treating symptomatic kidney cysts.<sup>1,5</sup> Percutaneous aspiration with sclerotherapy is a popular first approach, wherein a fine needle is introduced into the cyst under ultrasound imaging guidance. The fluid is aspirated or sucked out, following which sclerosant chemicals (e.g. 95% ethanol, 1% to 3% sodium tetradecyl sulphate, 50% acetic acid, or 10% ethanolamine) are injected into the cyst to cause inflammation and scarring to prevent re-accumulation of fluid within the cyst.

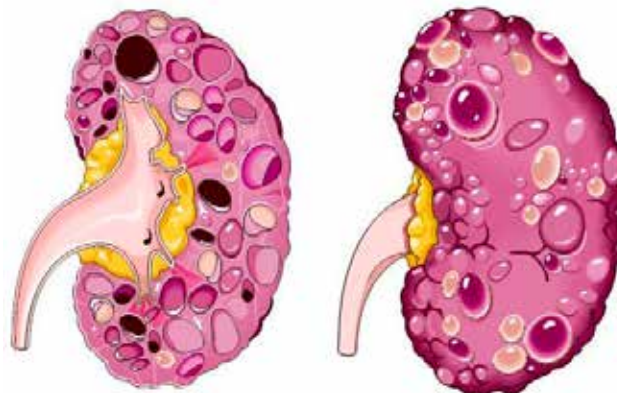
Laparoscopic deroofing of such cysts (also known as decortication or marsupialisation) remains the gold standard with the lowest incidence of cyst recurrence. In this minimally invasive procedure, the kidney cysts are dissected out using keyhole instruments, and the cyst wall is excised after draining all the fluid within the cyst.

If the cysts are chronically infected and/or have resulted in near complete loss of function of the affected kidney, urologists would recommend surgical removal of the affected kidney if the other kidney remains in good function. This

is known as simple nephrectomy. This avoids the problems of recurrent infections and future cancerous change of the affected non-functioning kidney.

## How frequently should I return to the doctor for follow-up?

You should consult your urologist on the most appropriate follow-up regime for your kidney cysts. Most surveillance protocols recommend follow-up with ultrasound imaging of the kidneys at six- to 12-monthly intervals for Bosniak 2 or 2F cysts. <sup>eh</sup>



Lateral view of a polycystic kidney illustrating the many cysts.

Figure 3. Diagram of a polycystic kidney, where healthy kidney tissue is replaced by non-functional fluid collections throughout the kidney

### References:

1. McGuire BB, Fitzpatrick JM. The diagnosis and management of complex renal cysts. *Current Opinion of Urology* 2010; 20: 349-354.
2. Novick AC, Campbell SC, Belledgrun A et al. AUA Guidelines for the management of the clinical Stage 1 renal mass. *American Urological Association* 2010.
3. Go AS, Chertow GM, Fan D, and McCulloch CE: Chronic kidney disease and the risks of death, cardiovascular events, and hospitalization. *N Eng J Med* 2004; 351: 1296.
4. Sprenkle PC, Power N, Ghoneim T et al. Comparison of open and minimally invasive partial nephrectomy for renal tumours 4-7cm. *European Urology* 2012; 61(3): 593-599.
5. Agarwal MM, Hemal AK. Surgical management of renal cystic disease. *Current Urology Reports* 2011;12: 3-10.



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