

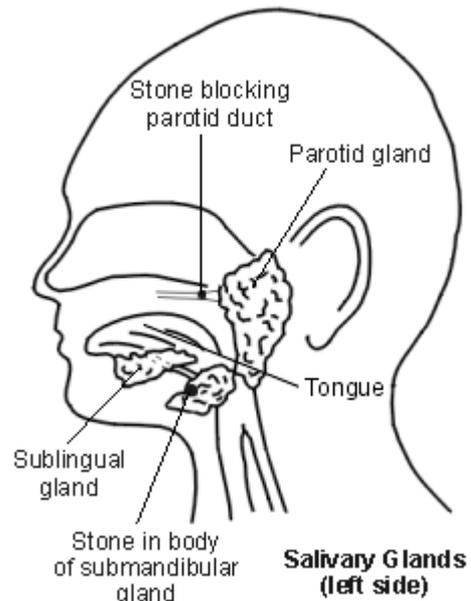
Salivary Gland Stones (Salivary Calculi)

One or more stones sometimes form in one of the salivary glands. A stone can cause a blockage of the flow of saliva which can lead to pain and swelling of the affected salivary gland. The reason why these stones form is not known. Sometimes a stone comes out into the mouth on its own, or with gentle probing. However, in many cases a small procedure is needed to remove the stone.

What are the salivary glands?

There are three pairs of glands that make saliva. Saliva drains into the mouth from these glands down short ducts (tubes). The parotid glands lie just below and in front of the ears. Saliva passes down the parotid duct into the inside of the cheeks. The submandibular glands are under the floor of the mouth - one on each side - and drain saliva up into the floor of the mouth. The sublingual glands are just beneath the tongue.

You make small amounts of saliva all the time to keep your mouth moist. When you eat, you normally make much more saliva which pours into your mouth.



What are salivary gland stones?

Some people form one or more small stones in a salivary gland. This occurs most commonly in people over the age of 40, although it can occur at any age.

The reason why a stone forms is not known. A salivary gland stone is sometimes called a sialolith or a salivary calculus. Most salivary stones are mainly made of calcium. However, there is no abnormality of the blood calcium level or any other problem with calcium in the body. Salivary gland stones are not usually associated with any other disease.

The size of the stone can vary from less than 1 mm to a few centimeters in diameter. About 9 in 10 stones are less than 10 mm in size.

Where do salivary gland stones occur?

About 8 in 10 salivary stones form in one of the submandibular glands. It is thought that the 'uphill' drainage and the slightly thicker saliva that is made in these glands is why stones are more likely to form there. The larger parotid glands drain saliva sideways into the mouth. They also make saliva that is 'thinner' than the submandibular glands. So, stones less commonly form in parotid glands. It is rare for a stone to form in a sublingual gland.

What are the symptoms of salivary gland stones?

The common symptoms are pain and swelling of the affected gland at mealtimes. This occurs if the stone completely blocks a duct. You normally make extra saliva during a meal which pours into the mouth. However, the saliva cannot pass into the mouth if the duct is blocked by a stone. The pain can be sudden and intense just after starting a meal. Swelling soon follows. The pain and swelling ease over about 1-2 hours after a meal.

However, most stones do not block a duct completely. A stone may only partially block saliva flow, or not block the flow at all if it is embedded in the body of the gland. In these situations the symptoms can vary and include one or more of the following:

- Dull pain from time to time over the affected gland.
- Swelling of the gland. Swelling may be persistent, or vary in size from time to time.
- Infection of the gland may occur causing redness and pain. This may develop into an abscess (ball of infection and pus) and make you feel quite unwell.

Some people with salivary gland stones have no symptoms at all. A stone may be found by chance on an x-ray picture taken for another reason.

Are any tests needed?

Symptoms are often typical and the diagnosis is usually clear. A doctor can sometimes feel or see a stone at the opening of a duct. An ordinary x-ray test can detect and show the position of about 8 in 10 salivary stones. No further tests are then needed.

However, in about 2 in 10 cases, the stone does not show on an x-ray and other tests may be needed. The test done may be one of the following:

- A scan such as a CT scan, ultrasound scan or MRI scan.
- Sialography (sialogram). This is a special x-ray test. It helps to show up the gland, the duct and any abnormalities of the duct such as a stone. For this test a small plastic tube is passed into the affected duct. A dye is then injected into the salivary gland. The tube is removed and x-ray pictures are taken. The x-ray pictures show up the dye within the gland and duct. This gives a good outline of the structures, and shows up any abnormalities.
- Sialendoscopy. In this test a very thin tube (endoscope) with a tiny light and camera at the tip is pushed into the salivary duct. The doctor can then see directly into the duct and gland to see if a stone is present.

What is the treatment for salivary stones?

Most stones that cause symptoms will not go away unless they come out or are removed. Sometimes a small stone comes out into the mouth by itself. If that does not occur, possible treatment options and procedures include the following:

- **Gentle probing** into the duct from inside the mouth with a thin blunt instrument can sometimes free a stone which then falls into the mouth. This is done by a doctor.
- **Therapeutic sialendoscopy**. This is a similar procedure to that described above. It also uses a very thin endoscope (tube) with a camera and light at the tip. The tube is pushed into the duct. If a stone is seen, then a tiny 'basket' or pair of 'grabbers' that are attached to the tube is used to grab the stone and pull it out. This technique can successfully remove about 17 in 20 stones. Local anesthetic is usually injected into the duct first to make this procedure painless. In some cases, where the stone is rather large, the stone is broken up first and then the fragments are pulled out.
- **A small operation** to cut out the stone is the traditional treatment, but is done less and less as therapeutic sialendoscopy has become available. It may still be needed if therapeutic sialendoscopy is not an available option, or if it fails.
- **'Shock wave'** treatment (lithotripsy) may be an option. This uses ultrasound waves to break up stones. The broken fragments then pass out along the duct. This is a relatively new treatment for salivary stones (although it has been used for some years to treat kidney stones). However, it is not done commonly. Sometimes shock waves are used to break up a large stone when therapeutic sialendoscopy is done to make smaller fragments which can be more easily removed.

A salivary stone is usually a 'one-off' event. After it is removed there are usually no further problems. However, some people develop one or more further stones at some later time.

Sometimes several stones form in the same gland. An operation to remove the whole gland may be an option for people who develop recurring or multiple stones. (You will make enough saliva by the remaining glands if one is removed.)

Can recurrent stones be prevented?

It is not clear why salivary stones develop and there are no definite ways in which to prevent them. Although there is no proof about the following, a good intake of fluid is said by some to help prevent the formation of stones. So, it may be wise to drink plenty of fluids especially if you exercise frequently or live in a hot country.

References

- [Adi Yoskovitch](#), Submandibular Sialadenitis. eMedicine. Dated December 2005
- [Therapeutic sialendoscopy](#), NICE Interventional Procedure Guidance (2007)
- [Nahlieli O, Nakar LH, Nazarian Y, et al](#); Sialoendoscopy: A new approach to salivary gland obstructive pathology. J Am Dent Assoc. 2006 Oct;137(10):1394-400. [abstract]

Comprehensive patient resources are available at www.patient.co.uk

Disclaimer: This article is for information only and should not be used for the diagnosis or treatment of medical conditions. EMIS and PiP have used all reasonable care in compiling the information but make no warranty as to its accuracy. Consult a doctor or other health care professional for diagnosis and treatment of medical conditions. For details see our [conditions](#).
© EMIS and PiP 2008 Updated: 19 Mar 2008 DocID: 4602 Version: 38