**FAQ PVNS**

1. **What is Pigmented Villonodular Synovitis (PVNS)/ Tenosynovial Giant Cell Tumor (TGCT)/ Giant Cell Tumor of the Tendon Sheath (GCTTS)?**

Doctors use different names for this condition: PVNS (pigmented villonodular synovitis), TGCT (tenosynovial giant cell tumor), and GCTTS (giant cell tumor of tendon sheath).

Even if the names sound different, they all describe the same type of problem: a benign (non-cancerous) growth that starts in the lining of a joint, a tendon, or a small sac of fluid near a joint (called a bursa).  
Today, doctors usually call all of these conditions TGCT – tenosynovial giant cell tumor. There are two main forms:

* Localized form (GCTTS): This is usually a small lump that grows slowly in the fingers or hands. It doesn’t spread, but it can cause swelling or stiffness.
* Diffuse form (PVNS): This affects the whole joint lining, most often in bigger joints like the knee or hip. It can make the joint swell, hurt, or become stiff, and it sometimes comes back after treatment.

Both forms look similar under the microscope, but they behave differently. The localized type is usually mild, while the diffuse type can be more aggressive inside the joint.

PVNS, TGCT, and GCTTS are different names for the same family of joint problems. The modern term is TGCT, and it can be either localized (small lump, usually hand/finger) or diffuse (whole joint, usually knee/hip).

1. **Is PVNS cancer? Can it spread to other parts of the body?**   
   PVNS (pigmented villonodular synovitis), also called diffuse TGCT, is a benign (non-cancerous) growth in the lining of a joint. Even though it is not cancer, it can still cause problems. PVNS can grow inside the joint and damage cartilage and bone. PVNS almost never spreads to other parts of the body. In very rare cases, doctors have reported that it changed into a cancer-like disease and spread to the lungs or lymph nodes, but this is extremely unusual. In short: PVNS is not cancer. It is a benign but sometimes aggressive joint disease that usually stays in one place. Rarely, it can behave more seriously, but this is exceptional.
2. **What causes PVNS? Is it genetic or hereditary?**

PVNS (pigmented villonodular synovitis, or diffuse TGCT) is a benign tumor that develops in the lining of a joint. The exact cause is still not fully known. Research shows that in PVNS, some cells in the joint produce too much of a signal called CSF1 (in the benign tumor cells). This signal attracts many immune cells (a type of white blood cell called macrophages) into the joint. These immune cells, together with the tumor cells, cause chronic inflammation and make the joint lining grow too much. This combination of tumor cells and inflammation explains why PVNS can damage the joint even though it is not cancer. In some cases, this problem is linked to a small change in the chromosomes of the tumor cells, but this happens only inside the affected joint: PVNS is not a hereditary disease and it does not run in families, and it is not something you can pass on to your children.

In short: PVNS is a benign tumor of the joint lining. It causes damage because of both tumor cells and ongoing inflammation, but it is not inherited and does not spread to family members.

1. **What are the symptoms of PVNS?**

PVNS (pigmented villonodular synovitis, also called diffuse TGCT) usually causes joint pain, swelling, and stiffness. In the diffuse form (most often in big joints like the knee or hip), symptoms usually start slowly. Patients may notice: ongoing pain in one joint, swelling with fluid in the joint, which can come back again and again, sometimes blood in the joint fluid (called hemarthrosis). With time, problems like locking, limited movement, or the joint “giving way” may appear. Since these symptoms are not very specific, it often takes more than a year before patients get the right diagnosis.

In the localized form of TGCT (GCTTS), which is different from PVNS, the disease looks different. It usually appears as a small, firm lump near a tendon, most often in the fingers or hand. The lump usually grows slowly, is often painless, but can sometimes cause mild discomfort or tenderness. It rarely causes joint problems unless the lump becomes large or presses on nearby structures.

Key differences:

* Diffuse (PVNS) → pain, swelling, stiffness, and possible joint damage or recurrence after treatment.
* Localized (GCTTS) → a small lump near a tendon, usually without serious functional problems.

In short: Diffuse PVNS tends to cause joint pain and damage, while localized GCTTS usually shows up as a painless lump in the hand or fingers.

1. **Which joints are most commonly affected by PVNS?**

PVNS (diffuse TGCT) most often affects the knee joint. In fact, about 7–8 out of 10 cases happen in the knee. The hip is the second most common site, and less often the ankle, shoulder, elbow, or wrist can be involved. It almost always affects just one joint. Involvement of both sides or many joints is very rare. It involves the whole joint lining and sometimes even tissues around the joint. This type has a higher chance of coming back after treatment.

Localized TGCT (GCTTS) instead usually affects the small joints of the hand and foot. It appears as a small lump next to a tendon and rarely causes big joint problems.

1. **What’s the difference between localized and diffuse PVNS/TGCT?**

There are two main types TGCT: localized and diffuse.

* Localized TGCT (also called GCTTS): Appears as a small lump next to a tendon, usually in the fingers or hand (sometimes in the foot). It usually grows slowly and is often painless. Symptoms are mostly limited to a small swelling or feeling a firm bump. It rarely affects joint movement unless the lump is very large. After surgery, it has a low chance of coming back, and the disease usually behaves mildly.
* Diffuse TGCT (also called PVNS): Affects the whole joint lining, most often in the knee (less often the hip or ankle). Symptoms include joint pain, swelling, stiffness, and fluid in the joint. As it progresses, the joint may lock, feel unstable, or lose movement. This form is more aggressive: it can damage bone, extend outside the joint, and often comes back after treatment.

In short:

* Localized TGCT (GCTTS): a small, usually painless lump in the fingers or hand, mild course, low recurrence.
* Diffuse PVNS: affects big joints (mainly the knee), causes pain and swelling, can damage the joint, and has a higher risk of coming back.

1. **How is PVNS diagnosed?**

Doctors use a combination of symptoms, imaging tests, and tissue analysis to diagnose PVNS.

* Symptoms: Diffuse PVNS (usually in the knee or hip) often causes pain, swelling, stiffness, and fluid in the joint. Sometimes blood can be found in the joint fluid. Localized PVNS (GCTTS) usually appears as a small lump in the hand or foot, and is often painless. Rarely, it can be found as a single lump inside a larger joint.
* Imaging tests: X-rays are often normal but can show swelling or, in advanced cases, bone damage. MRI is the best test. It shows the typical changes of PVNS and helps the doctor see how much of the joint is affected. In PVNS, the whole joint lining looks thickened. In GCTTS, MRI shows a single, well-defined lump.
* Tissue analysis (biopsy): To confirm the diagnosis, doctors may take a sample of the tissue. Under the microscope, both forms show special features such as brown pigment (iron deposits), giant cells, and inflammation.

In short: TGCT is diagnosed by a combination of symptoms, MRI scan, and biopsy. MRI is especially important to see whether the disease is localized (small lump) or diffuse (whole joint lining).

1. **How rare is PVNS? What is its prevalence/incidence?**

TGCT is defined as a rare disease. The diffuse form (PVNS) affects about 4–5 people per million each year. The localized form (GCTTS) is more common, especially in the fingers and hand, with up to 30 cases per million each year in those joints. Overall, PVNS/TGCT usually affects adults between 20 and 50 years old, and it is seen slightly more often in women. The knee is the joint affected in most cases (about 70–80%). The hip is the second most common, while the ankle, shoulder, and other joints are less often involved. Diffuse PVNS mainly involves large joints like the knee and hip. Localized TGCT (GCTTS) usually affects the small joints of the hand and foot.

In short: PVNS/TGCT is a rare benign joint tumor. The diffuse type is uncommon, while the localized type (especially in the fingers) is seen more often. The knee is by far the most frequent site.

1. **What are the treatment options for PVNS?**

* Localized TGCT (GCTTS): The treatment is usually surgery to remove the lump. Recurrence (the disease coming back) is not very common.
* Diffuse TGCT (PVNS): This type is harder to treat because it affects the whole joint lining, most often the knee. The main treatment is a total synovectomy – surgery to remove all of the affected joint lining. Surgery can be done open (through a larger cut) or arthroscopic (using a camera and small instruments). In diffuse PVNS, open surgery has lower chances of recurrence compared to arthroscopy. Even with surgery, the disease can come back. Recurrence rates are reported between 15% and 50%, especially in the knee. Other treatments (when surgery is not possible or the disease keeps coming back) are radiotherapy or targeted medicines. Radiotherapy (radiosynoviorthesis or external beam radiation) can help lower the risk of recurrence. Targeted medicines (CSF1R inhibitors such as pexidartinib or vimseltinib) can shrink the tumor and improve symptoms. They are used only in advanced or non-operable cases, and treatment is managed by a specialized tumor team.

In short: for localized TGCT surgery is usually enough, for PVNS surgery is harder, recurrence is more common, and sometimes radiation or special medicines are needed. Care is best planned by a multidisciplinary team (surgeons, oncologists, radiologists).

1. **What is the recovery time after PVNS surgery?**

Recovery depends on the type of TGCT (localized or diffuse), the joint involved, and the surgical technique.

* Localized TGCT (GCTTS): usually in the hand or foot, surgery is simpler, and recovery is usually fast (2–6 weeks). Most patients quickly return to normal daily activities. Complications are rare if the lump is completely removed.
* Diffuse TGCT (PVNS): usually in large joints like the knee, recovery takes longer. After arthroscopic surgery (keyhole technique), many patients feel better in 6–12 weeks, but full recovery of strength and movement can take 3–6 months. After open surgery, recovery is often 3–6 months or longer, because the operation is bigger and the joint can become stiff. Intensive physiotherapy is often needed, and sometimes extra treatments (like manipulation under anesthesia) are required to improve movement.

General rules: Small joints (hand, foot) + localized TGCT → fast recovery (a few weeks). Large joints (knee, hip, ankle) + diffuse TGCT → longer recovery (several months).

Arthroscopy = faster recovery but higher risk of recurrence in diffuse PVNS compared to open surgery.

In short: Localized TGCT in small joints → recovery in 2–6 weeks. Diffuse TGCT in large joints → recovery in 3–6 months, depending on surgery type and rehab.

1. **What is the recurrence rate after treatment?**

The chance of recurrence (the disease coming back) depends on the type of TGCT and the treatment used.

* Localized TGCT (GCTTS): After surgery, the chance of recurrence is low (about 7–12%). If it comes back, it usually happens within the first 2–5 years. Open and arthroscopic surgery work equally well, as long as the whole lump is removed.
* Diffuse TGCT - PVNS (most often in the knee): The chance of recurrence is higher (12–44%). Recurrence is more common if surgery cannot remove all of the diseased tissue. Arthroscopic surgery (keyhole) has recurrence rates around 12–28%. Open or combined surgery (larger cut, sometimes front and back of the knee) lowers the risk to about 8–22%.

Additional treatments: Radiotherapy after surgery can reduce recurrence further (down to 8–19%), especially for diffuse cases that are hard to remove or come back. Targeted medicines (CSF1R inhibitors like pexidartinib): used when the tumor cannot be removed with surgery or keeps coming back. These medicines can shrink the tumor and improve symptoms, but we still don’t know the long-term results.

In short: Localized TGCT (GCTTS): recurrence 7–12%, Diffuse TGCT (PVNS) recurrence 12–44%, especially in the knee. Radiotherapy and new targeted medicines are options when surgery is not enough. Most recurrences happen within 2–5 years after treatment.

1. **Can PVNS lead to arthritis or permanent joint damage?**

Yes, PVNS (diffuse TGCT), the tumor makes the joint lining grow too much and causes chronic inflammation, repeated fluid build-up, and sometimes bleeding inside the joint. Over time, this can wear down the cartilage and bone, leading to arthritis (osteoarthritis) and permanent joint damage. This risk is highest in large joints such as the knee and hip. Delayed diagnosis and disease recurrence after surgery increase the chance of long-term damage. Often requires multiple surgeries because it tends to come back (recurrence rates up to 12–44% at 5 years). Repeated recurrences or incomplete surgery can lead to progressive joint problems. In severe cases, patients may eventually need a joint replacement (arthroplasty).

Localized TGCT (GCTTS) usually affects small joints like the fingers, and if the lump is completely removed, it almost never causes serious joint damage. Long-term outcomes are generally excellent.

In short: Localized TGCT → rarely causes damage if removed completely. Diffuse TGCT → can damage the joint over time, often comes back, and may lead to arthritis or even the need for joint replacement.

1. **Are medications like CSF1R inhibitors (e.g., pexidartinib) used for PVNS?**

* Are there medicines to treat PVNS/diffuse TGCT? Yes. Medicines called CSF1R inhibitors can be used, when surgery is not possible or if the disease comes back many times.
* Which medicine are approved? Pexidartinib is the first medicine approved in the United States but is not approved in Europe for adults with PVNS who cannot have surgery or would not benefit from surgery. Vimseltinib is a new medication in phase of approval, it is likely going to be approved in Europe too, but at the moment is still on testing phase.
* How do these medicines work? PVNS happens because certain joint cells make too much of a signal called CSF1, which attracts immune cells and causes the tumor. CSF1R inhibitors block this signal, which can shrink the tumor, reduce swelling and pain, improve joint movement
* How effective are they? In clinical studies, many patients had smaller tumors, less pain, and better function. These medicines work best in diffuse or advanced PVNS.
* What are the side effects? Most common: tiredness, changes in hair color, nausea. Serious but less common: liver problems. Because of this, patients need regular blood tests to check liver function.
* Who decides if I need these medicines? A specialist team (surgeons, oncologists, radiologists) will decide. Medicines are usually given only if surgery is not an option or the disease keeps coming back.

1. **Can PVNS occur in children or adolescents?**

Yes, but it is rare. The knee is the most common joint affected, followed by the ankle. Symptoms often include pain, swelling, and stiffness in one joint. Because these symptoms can look like other childhood conditions (such as juvenile arthritis), diagnosis is sometimes delayed. Recurrence rates in children are similar to adults (about 40–45%).

Treatment: The main treatment is surgery (synovectomy) to remove the diseased joint lining. Arthroscopic surgery (keyhole technique) is often used for localized disease, open or combined surgery is usually needed for diffuse disease. Regular follow-up is important to check for recurrence and protect joint function.

1. **What follow-up care is needed and how often should I be monitored?**

Regular check-ups are important to detect recurrence early, check joint movement and function, prevent long-term damage or arthritis.

* Follow-up for PVNS/ diffuse TGCT (most often in the knee or hip): First MRI and check-up about 3 months after surgery, then every 6 months for 2 years, then once a year up to 5 years. After 5 years follow-up is tailored to the patient, since late recurrences are possible. At each visit, the doctor checks pain, swelling, mobility, and function
* Follow-up for localized PVNS/TGCT (usually in the hand or foot): First MRI and check-up 3–6 months after surgery, then yearly visits for 3 years with MRI in case of recurrence of clinical symptoms (pain, swelling, stiffness).
* In children and teenagers the same scheme is applicable.