

Not Every Draining Wound is Infection: Vicryl Reaction after Total Knee Arthroplasty Mimicking Prosthetic Joint Infection – A Case Series and Diagnostic Insights

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Learning Point of the Article:

Post-operative wound complications after Total Knee Arthroplasty presenting with pus discharge may represent Vicryl suture reaction rather than Peri-Prosthetic Joint Infection; histopathological confirmation and timely debridement prevent unnecessary antibiotics and revision surgery.

Abstract

Introduction: Vicryl reaction, also known as suture-related pseudo-infection (SRPI) or suture granuloma, is a rare but important differential diagnosis of post-operative wound complications following total knee arthroplasty (TKA). It mimics prosthetic joint infection, often leading to diagnostic confusion and potential overtreatment. Given the widespread use of braided absorbable sutures like polyglactin 910, recognizing this entity is essential to avoid unnecessary interventions.

Materials and Methods: We present a case series of four patients who developed delayed wound complications following TKA. Clinical evaluation included assessment of fever, range of motion (ROM), and local wound findings. Laboratory investigations (total leukocyte count, C-reactive protein, erythrocyte sedimentation rate), radiological assessment, microbiological cultures (wound swab, knee aspirate, intra-operative samples), and histopathological examination were performed. Three patients underwent surgical debridement with tissue sampling, while one patient was managed conservatively.

Discussion: All patients presented with localized wound complications, most commonly over the infra-patellar region along the suture line, with preserved and painless knee ROM. Systemic signs were minimal, with fever present in only one case. Laboratory markers showed variable elevation, while radiology was normal in all cases. Microbiological cultures were largely negative or inconsistent. Histopathology revealed a foreign body granulomatous reaction with giant cells, confirming Vicryl reaction/SRPI. Patients who underwent debridement with removal of suture material showed complete recovery, whereas the conservatively managed patient had persistent sinus, highlighting the importance of surgical management.

Conclusion: Vicryl reaction or SRPI should be suspected in patients with delayed wound complications after TKA, especially in the absence of joint involvement. Early recognition, histopathological confirmation, and timely debridement can prevent unnecessary antibiotic use and avoid radical procedures such as two-stage revision arthroplasty.

Keywords: Vicryl reaction, suture granuloma, suture-related pseudo-infection, prosthetic joint infection, total knee arthroplasty.

Introduction

Sutures are foreign biomaterials implanted into tissue, and their

interaction with host immune mechanisms may lead to inflammation, infection, or foreign body reactions. Different

Author's Photo Gallery



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suture materials – natural or synthetic, absorbable or non-absorbable – demonstrate variable tissue reactivity, with braided sutures generally producing greater inflammatory responses than monofilament sutures [1]. Although surgical site infection (SSI) following total knee arthroplasty (TKA) is relatively uncommon, occurring in approximately 1% of procedures [2], post-operative wound complications remain a significant concern for surgeons. In addition to microbial infection, host factors such as immune status, comorbidities, and the local tissue environment may influence the likelihood of adverse tissue reactions to sutures [1].

Occasionally, post-operative wound inflammation and discharge may clinically resemble SSI but represent a distinct non-infective entity known as suture-related pseudo-infection (SRPI), also described as Vicryl reaction or suture granuloma. SRPI is a rare complication following TKA in which a foreign body reaction to suture material mimics post-operative infection, often leading to diagnostic uncertainty [3]. The pathophysiology of this reaction involves a foreign body immune response characterized by protein adsorption, inflammatory cell infiltration, macrophage activation, and formation of foreign body giant cells around the suture material [4].

Vicryl reaction typically presents as a delayed post-operative inflammatory response, most commonly occurring 6–9 weeks after surgery, which corresponds to the absorption phase of Vicryl sutures (approximately 56–70 days) [5]. This timing suggests that the reaction is related to degradation of the absorbable suture material and the resulting foreign body response. Clinically, patients may present with pain, erythema, swelling, and wound discharge, occasionally accompanied by mild fever features that closely mimic prosthetic joint infection (PJI) and often raise diagnostic concern [6]. In some cases, patients develop mild pain with a discharging sinus along the surgical scar, further increasing suspicion of periprosthetic joint infection [3]. Such presentations can make differentiation from true SSI challenging.

Recognizing this entity is important because it can closely mimic infection yet requires different management. In this report, we present a case series of four patients who developed Vicryl-related reactions following TKA,

highlighting the clinical presentation, diagnostic challenges, and management considerations.

Case Series

We report a case series of four patients who developed signs of infection following TKA. All patients initially had an uneventful post-operative recovery and subsequently presented with delayed wound-related symptoms along the surgical incision line. The most common clinical presentation was a non-healing wound over the suture line, frequently associated with sero-sanguineous, serous, or occasionally sero-purulent discharge. The infra-patellar region, particularly around the tibial tuberosity, was the most commonly affected site in all cases.

On clinical examination, patients demonstrated localized tenderness over the suture site with surrounding erythema. However, an important distinguishing feature was that the range of motion (ROM) of the knee joint remained full, painless, and unrestricted in all patients. None of the patients exhibited signs suggestive of deep joint involvement, and no pus was found in the knee joint aspirate.

Microbiological assessment showed negative culture results in three of the four patients, supporting a non-infective etiology. One patient in the series had a history of rheumatoid arthritis, which may have contributed to an altered and exaggerated immune response. The clinical presentation in these patients closely resembled post-operative infection, leading to diagnostic uncertainty.

Case Descriptions

Case 1

Sixty four years old woman who underwent TKA presented approximately 40 days after surgery with complaints of a non-



Figure 1: Different stages of management of Case 1 till complete healing



Figure 2: Different stages of management of Case 2 till complete healing

healing wound over the infra-patellar region along the surgical suture line. Slough was visible over the wound site, but there was no active pus discharge and no associated fever. Clinical examination revealed that the ROM of the knee was full and painless. Knee aspiration yielded sero-sanguineous fluid, with no evidence of intra-articular pus (Fig. 1).

Case 2

A 43-year-old woman who was a known case of rheumatoid arthritis underwent bilateral TKA and presented about 55 days after TKA with persistent wound discharge over the surgical suture line, predominantly in the infra-patellar region. The patient initially noticed watery discharge on and off soon after suture removal, which gradually progressed to serous discharge. There was no history of fever, and the knee joint demonstrated full, painless ROM. Knee aspirate was serous in nature (Fig. 2).

Case 3

A 70-year-old patient presented approximately 134 days after TKA with localized swelling over the infra-patellar region along the surgical suture line for 10–12 days. The patient reported scanty thick discharge from the infra-patellar region for 2 days. On examination, there was expressed pus discharge from the site. The patient had a history of fever for 1 week, raising suspicion of infection. However, clinical examination demonstrated full and painless knee ROM, and knee aspiration revealed serous fluid, indicating absence of deep joint infection (Fig. 3).



Figure 3: Different stages of management of Case 2 till complete healing

Case 4

A 60-year-old gentleman presented approximately 28 days after TKA with complaints of watery discharge from the infra-patellar suture line, which began 3–4 days after suture removal. There was no associated fever, and examination showed painless knee ROM which was terminally restricted. Knee aspiration revealed sero-sanguineous fluid, with no evidence of intra-articular purulence (Fig. 4).

All four cases were operated on by the same surgeon in the same

setup. All standard protocols for prevention of infection were followed. Vicryl or Braided Coated Polyglactin 910 (2-0 size, continuous locking pattern) was used to close the arthrotomy in all the patients. Across all cases, pain and the discharge were localized to the infra-patellar suture line with local rise of temperature and erythema limited to the immediate vicinity. These symptoms pointed toward probable PJI.

However, on taking detailed history and performing further investigations, we found that fever was absent in 3 out of 4 cases, with only one patient (Case 3) presenting with fever, indicating that systemic signs were largely absent despite local wound findings. Total leukocyte count (TLC) values were within normal limits or only mildly elevated across all cases (range: $\sim 5.0\text{--}11.9 \times 10^3/\text{mm}^3$), again suggesting a lack of significant systemic infection. C-reactive protein (CRP) was elevated in 3 cases (Cases 1, 2, and 3), with notably higher values in Cases 2 and 3, while Case 4 showed near-normal levels. Erythrocyte sedimentation rate (ESR) was elevated in all cases, particularly in Case 2 and Case 3, reflecting a chronic inflammatory response rather than definitive infection. X-ray of the knee showed

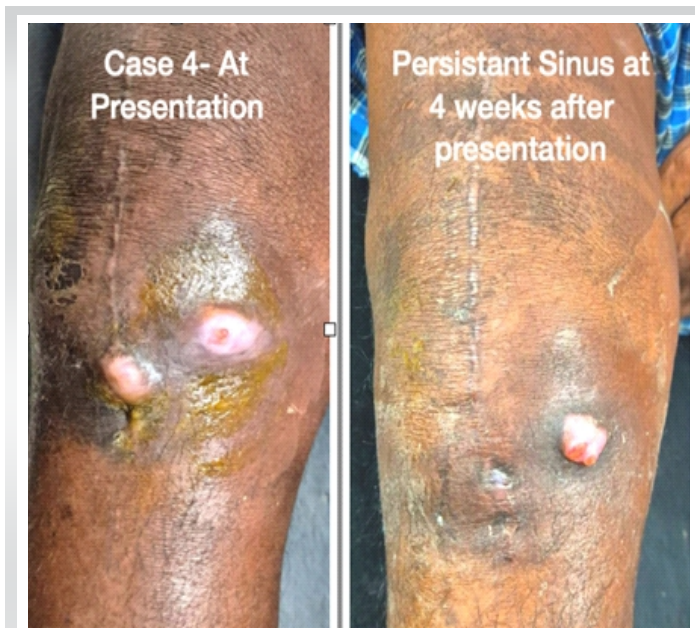


Figure 4: Stages of the 4th case without debridement at presentation and persistent sinus even after 4 weeks of presentation.

normal radiological findings in all cases, with no evidence of prosthesis-related complications or loosening, supporting the absence of deep infection. Furthermore, preserved and painless knee mobility and absence of pus in the joint aspirate created a dilemma supporting an alternative diagnosis rather than true PJI.

Therefore, we decided to investigate further. We approached the patients as follows.

- The patients were examined clinically and the ROM of the knee was checked. Swab from the discharge and knee aspirate were sent for Gram stain and culture and sensitivity.
- All relevant blood investigations including TLC, CRP, and ESR were done.
- As none of the patients had signs of sepsis or presence of an abscess in the knee joint, we did not start antibiotics for the patients. Rather, we decided to locally debride the non-healing wound first. The patient described in Case 4 refused the debridement procedure, and hence, prophylactic oral antibiotics were prescribed right after sending his wound discharge and knee aspirate sample for microbiological examination.
- Intra-operative debrided tissue was sent for histopathological examination, and discharge was sent for Gram stain and culture and sensitivity for the first 3 cases.
- The wound was closed with only stay sutures for a second look after 5 days.
- Empirical broad-spectrum antibiotic was started for the first 3 cases after the debridement procedure, namely injectable piperacillin-tazobactam.

- Wound was opened for the 2nd time 5 days after the first procedure for a probable presence of slough or infection, and definite closure was performed with Nylon sutures only.
- Sutures were removed after 12–14 days.

Intra-operative findings (Fig. 1, 2, 3)

- None of the cases had any evidence of deep-seated infection.
- Cases 1 and 2 had remnants of Vicryl suture visible intra-operatively. This finding prompted us to ponder in the line of a probable “Vicryl reaction,” and hence, we sent debrided tissue for histopathological examination.
- Definitive closure was performed using only Nylon Sutures.

The results of histopathological examination (available in 3 cases) consistently showed features of foreign body reaction, including macrophage infiltration, foreign body giant cell formation, and granulomatous inflammation/non-specific inflammatory changes.

The results of clinical, microbiological, histopathological, radiological, and blood investigations for all four cases are summarized in Table 1.

Results (Table 1)

Post-operative/4 weeks follow-up

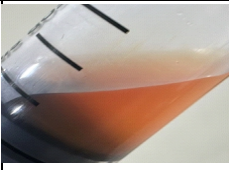
- Cases 1, 2, and 3 who underwent local debridement were followed up, and sutures were removed after 12–14 days
- Wounds were healed completely and showed no signs of inflammation after 4 weeks for Cases 1, 2, and 3 (Fig. 1, 2, 3).
- Case 4 who had refused debridement was followed up, and persistent sinus was found at 4 weeks after presentation (Fig. 4).

Discussion

Vicryl (polyglactin 910) is a commonly used absorbable braided suture material in orthopedic surgery because of its favorable handling characteristics and predictable absorption profile. However, as with any implanted biomaterial, it may occasionally provoke foreign body reactions that mimic post-operative infection. The first evidence of Vicryl-related hypersensitivity reactions available in the literature was probably described in 1977 in a case of strabismus surgery, where the authors highlighted that although such reactions are rare, surgeons should consider suture hypersensitivity when unexplained post-operative inflammation occurs to avoid misdiagnosis and inappropriate treatment [7].

The clinical presentation of Vicryl reaction or SRPI can closely resemble PJI. Patients may present with localized wound inflammation, discharge, and occasionally mild systemic

Table 1: Investigation Findings

	Case 1	Case 2	Case 3	Case 4
Age/Sex	64/F	43/F	70/F	60/M
Suture Material used	Braided Coated Polyglactin 910	Braided Coated Polyglactin 910	Braided Coated Polyglactin 910	Braided Coated Polyglactin 910
Time Of Presentation	40 Days	55 days	139 days	28 days
Fever	Absent	Absent	Present	Absent
TLC	$5.04 \times 10^3 / \text{mm}^3$	$10.3 \times 10^3 / \text{mm}^3$	$11.97 \times 10^3 / \text{mm}^3$	$6 \times 10^3 / \text{mm}^3$
CRP	6 mg/L	43 mg/dL	38 mg/L	3 mg/dL
ESR	15 mm/hr	76 mm/hr	42 mm/hr	29 mm/hr
Abscess	Frank Pus Absent	Frank Pus Absent	Frank pus expressed	Frank pus Absent
	Slough present	Sero-sanguinous discharge		Serous discharge
Wound Swab C/S	No growth	E. Coli	No growth	No growth
Nature of Knee Aspirate				
	Sero-sanguinous	Serous	Serous	Sero-sanguinous
Knee Aspirate C/S	No growth	No growth	No growth	No growth
Intra-operative Sample C/S	No growth	Enterobacter Cloacae	No growth	-----
Vicryl remnant	Present	Present	Absent	-----
Histopathological examination	Macrophage	Non-specific inflammation	Macrophage	-----
	Giant cell formation	Foreign body reaction with occasional giant cells	Lymphocytic inflammatory infiltrate	
	Granuloma		Presence of foreign body giant cells	
Sinus	Absent	Healed after surgery	Healed after surgery	Persistent
Knee Radiology	Normal	Normal	Normal	Normal
	No obvious signs of loosening	No obvious signs of loosening	No obvious signs of loosening	No obvious signs of loosening
Knee ROM	Preserved and Painless	Preserved and Painless	Preserved and Painless	Terminally restricted and Painless

symptoms, making differentiation from infection difficult. Previous studies have reported that laboratory investigations may show mildly elevated inflammatory markers such as ESR or CRP while white blood cell counts remain normal or only slightly elevated [6]. Similar findings were observed in our series, where TLCs were within normal limits or only marginally elevated, while CRP was raised in three of the four patients and ESR was raised in two of the four cases. The exceptionally high CRP and ESR in Case 2 of our series could be due to the acute exacerbation of inflammation due to rheumatoid arthritis.

Imaging modalities such as ultrasound may reveal small subcutaneous or fascial collections without intra-articular involvement, which further supports the diagnosis of superficial pathology rather than deep joint infection [3,5]. In addition, microbiological cultures are often negative, and histopathology

typically demonstrates a foreign body granuloma with inflammatory infiltrates and giant cells, confirming a suture-related reaction rather than true infection [3].

In our series, the clinical presentation was largely consistent with the literature. All patients demonstrated localized wound complications over the infra-patellar suture line while maintaining painless and full knee ROM, suggesting absence of intra-articular involvement. The reason why the infra-patellar region over the tibial tuberosity was affected in all four cases needs explanation. One of the speculated reasons could be the lack of ample soft tissue coverage and the presence of less fatty tissue. Literature largely lacks an explanation regarding the involvement of this typical location.

Importantly, none of the patients had pus within the knee joint, and all were operated by the same surgeon in the same setup

following strict standard infection prevention protocols, reducing the likelihood of true deep infection. Three patients underwent surgical debridement with removal of the affected tissue along with 2–3 mm margin of healthy tissue and subsequently recovered without the need for arthrotomy or opening of the joint, which is consistent with previous reports showing rapid clinical improvement following removal of the offending suture material and the affected tissue [6]. Conversely, the fourth patient who declined debridement continued to experience persistent watery discharge and sinus despite prolonged empirical antibiotic therapy, highlighting that removal of the causative suture material is crucial for resolution.

Microbiological evaluation in such cases may occasionally produce confusing results. In our series, three patients had negative cultures, while one patient showed bacterial growth in both pre-operative swab and intraoperative samples; however, the organisms isolated (namely, *Escherichia coli* and *Enterobacter Cloacae*) were different and are known skin contaminants [8,9]. Histopathology in this patient revealed foreign body giant cell reaction, supporting the diagnosis of Vicryl reaction. It is possible that the culture positivity represented sample contamination or a superimposed superficial infection overlying a suture-induced inflammatory reaction.

Braided sutures such as Vicryl have been shown to provoke higher tissue reaction, whereas monofilament sutures like Monocryl produce less inflammatory response [10]. Although modifications such as triclosan-coated sutures have been proposed to reduce SSIs, clinical trials have shown no significant reduction in SSI rates following hip or knee arthroplasty, questioning their routine use [2]. However, the literature does not report an increase or decrease in the rate of hypersensitivity reactions with their use.

Management of post-operative wound complications following TKA requires careful evaluation, as delayed or inappropriate treatment may lead to progression from superficial pathology to deep peri-prosthetic infection [10]. Literature suggests that surgical irrigation and debridement often reveal sterile abscesses with or without retained Vicryl sutures, and removal of the suture material along with surrounding tissue can lead to resolution of symptoms [5, 10]. In some cases, recurrence of inflammatory symptoms has been reported when the same absorbable suture material was reused during subsequent procedures, further supporting the theory of suture-induced reaction [5]. Histopathological examination demonstrating foreign body granuloma with giant cells remains an important diagnostic tool for confirming the condition and avoiding unnecessary aggressive procedures such as prosthesis removal

[6].

The findings from our case series reinforce the concept that Vicryl-related reactions can closely mimic infection yet represent a distinct clinical entity requiring different management. Early recognition is essential to prevent prolonged antibiotic therapy, repeated investigations, or unnecessary revision surgery.

Preventive strategies may include the preferential use of monofilament sutures instead of braided absorbable sutures such as Vicryl in selected cases, particularly in patients with suspected suture hypersensitivity, and avoiding the re-use of absorbable sutures during wound closure following debridement to minimize the risk of recurrent foreign body reaction.

Although well-defined diagnostic criteria for Vicryl reaction are lacking in the literature, definitive diagnosis relies on histopathological examination demonstrating a foreign body granulomatous reaction. However, as Vicryl reaction and infection may coexist, the presence of a foreign body reaction should not lead to exclusion of infection, particularly when wound discharge, knee aspirate, or intra-operative cultures yield pathogenic organisms. Therefore, microbiological findings should always be interpreted in conjunction with clinical, laboratory, and histopathological evidence.

Surgeons should therefore maintain a high index of suspicion for suture-related reactions when patients present with localized wound complications several weeks after arthroplasty, particularly in the absence of joint involvement.

Conclusion

This case series highlights Vicryl reaction or SRPI as an important and often under-recognized cause of delayed wound complications following TKA. The findings emphasize that not all post-operative wound discharge represents PJI, and careful clinical assessment is crucial to avoid misdiagnosis.

A key takeaway from this study is that preserved, painless ROM with absence of intra-articular pus strongly suggests a superficial pathology rather than deep periprosthetic infection. In all our cases, the pathology was localized to the infra-patellar suture line, and none required arthrotomy or prosthesis removal. This reinforces the importance of correlating clinical findings with investigations rather than relying solely on wound appearance or isolated culture results. Secondly, the study demonstrates that laboratory parameters such as CRP may be elevated despite absence of true infection, and microbiological cultures can be negative or misleading. Therefore, histopathological confirmation of foreign body granuloma remains a valuable diagnostic tool in differentiating Vicryl

reaction from infection.

Timely surgical debridement with removal of offending suture material and inflamed tissue is both diagnostic and therapeutic, leading to complete resolution in most cases. In contrast, delayed or conservative management, as seen in one patient, may result in persistent sinus and prolonged morbidity.

Finally, this series underscores the need for preventive strategies, including the preferential use of monofilament sutures over braided materials like Vicryl in selected cases, and avoiding re-use of absorbable sutures during closure after debridement. Overall, increased awareness of this entity can help surgeons avoid unnecessary investigations, prolonged antibiotic therapy, and radical procedures such as two-stage revision arthroplasty, thereby improving patient outcomes and optimizing resource utilization.

Clinical Message

Delayed wound discharge or sinus following total knee arthroplasty, particularly in the absence of clinical joint involvement, should raise suspicion for Vicryl-related foreign body reaction in addition to prosthetic joint infection. A high index of suspicion is essential to appropriately evaluate and exclude infection, as foreign body reaction and infection are not mutually exclusive and may coexist. Histopathological examination remains the cornerstone for confirming Vicryl-related foreign body reaction and should be routinely performed in suspected cases. Preventive strategies, including the preferential use of monofilament sutures in selected patients and avoidance of absorbable sutures during wound closure after debridement, may help reduce the risk of recurrent suture-related foreign body reaction.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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