



## Case Report

Ayurveda management of Nicolau syndrome W.S.R to *Kotha* – a case reportRamesh S Killedar<sup>\*</sup>, Shivay Gupta, Pradeep Shindhe

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## ABSTRACT

Administration of intramuscular, intraarterial or subcutaneous injection of particular drugs ends up into a rare entity known as Nicolau syndrome (NS). The viscous nature of these drugs sometimes triggers acute vasospasm and even arterial embolism. There is no consensus on treatment of NS so far. Phasic treatments depend on the extent of the necrotic lesion and ranges from medication to surgical debridement. Here we report a case of 60 year female known case of Knee Osteoarthritis who was dependent on Diclofenac injection IM for relief of pain. She presented with complaints of fever with chills, rigors, discoloration of skin at the gluteal region right side, later turned into necrosis of skin and adipose tissue, pus formation and associated with loss of appetite, dryness of mouth, pedal oedema. The case was diagnosed as NS according to contemporary science and *Kotha* (Gangrene) as per Ayurveda. The case was treated successfully with *Chedana karma* (Surgical debridement) followed by *Vrana shodhana* (making free from undesirable healing factors), *Ropana* (Closure of wound) and oral medications.

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## 1. Introduction

Skin manifestations occurring due to iatrogenic causes possess a serious threat and create a socioeconomic burden, one such rarely encountered condition is Nicolau syndrome, which occurs immediately, following an intramuscular drug administration [1]. It represents an acute symptom complex of severe pain at injection site, erythema or blanching (ischemic pallor) of the skin and eventually leading to the skin and underlying tissue necrosis which may be associated with a range of both injection sites and drugs [2].

Freudenthal in 1920 reported the first case of NS in syphilis after administration of injections containing bismuth salts [3]. The incidence of NS is also observed with various injections, including: penicillin's, local anesthetics (e.g. lidocaine), vaccines, corticosteroids, NSAIDs [4]. Clinical features of NS typically include three phases, i.e initial, acute and necrotic, management is done accordingly. *Pseudomonas aeruginosa* and *Staphylococcus aureus* are the common organisms found in culture report of NS [5]. Surgical treatment is the treatment choice in necrotic phase, which depends

on the size of the affected site [6]. NS can be correlated with *Kotha* (Gangrene) as per *Ayurveda*, which presents with signs like discoloration/blackishness, putrefaction, pus discharge, foul smell [7]. *Acharya Shushruta* explained *Chedana karma* followed with *Vrana Shodhana* (wound cleansing) and *Ropana* (wound healing) for better treatment outcome [8]. The adopted *Ayurveda* treatment in this case has given good result in the management of NS.

## 2. Patient information and clinical findings

A 60 year female non diabetic, non-hypertensive, known case of knee osteoarthritis presented with complaints of pain, swelling and blackish discoloration of skin (Fig. 1a) at right gluteal region since 12 days, along with pus discharge, foul smell and fever from last 5 days. The Case was treated at KLE Ayurveda Hospital, Belagavi, Karnataka, from 04/01/2018 to 04/02/2018 (OPD NO 18000191/IPD-0865) [Table 1]. The Patient had a history of IM Injection for the knee joint pain following which she developed above complaints. The patient was initially managed with Antibiotics (IV for 1 day and Oral for 5 days), Anti-inflammatory drugs, Intravenous fluids from the doctor who has given her an IM injection earlier and she got symptomatic relief later discontinued the medications. In the later phase she developed fever with chills and rigors, discoloration of the skin, followed with necrosis of skin and adipose tissue. Past

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history and family history were not specific to the disease. She was anaemic, thin built and moderately nourished. Systemic examination reveals tachypnea, tachycardia with an increased pulse rate (110/min). Local examination revealed skin discoloration with necrosis of adipose tissue measuring 20 cm × 22 cm at Right gluteal region (Fig. 1a), inflamed edges, 1–2 cm opening at the lateral aspect of gluteal region through which *Puyasrava* (pus discharge) and *Visra gandha* (foul smell) was encountered. Local rise of temperature along with tenderness was present. Blood investigations showed a WBC count – 8200 cells/cu mm (Neutrophil – 58%, Lymphocyte – 34%, Eosinophil – 06%), ESR – 105mm/1st hour, RBS – 93 mg/dL Hb – 9.4 gm%, Blood urea - 33 mg/dL, Serum Creatinine – 0.8 mg/dL, HbsAg, HIV I and II were negative. Urine investigations were under normal limits.

### 3. Timeline

The patient developed complain of pain, swelling and blackish discoloration at the right gluteal region in Jan 2018 following IM Injection for knee joint pain. Initially she took treatment from local practitioner and on 4/01/2018 patient consulted for Ayurveda treatment.

### 4. Diagnosis

Gluteal abscess, necrotizing fasciitis were taken as differential diagnosis. Necrotizing fasciitis is rapidly progressing necrosis of soft tissue infection spreading along fascial planes with or without overlying cellulitis accompanied by severe systemic toxicity which occurs after surgery, or penetrating injury [9]. An abscess is a localized collection of purulent fluid most commonly seen in immune compromised individuals and is rare following intramuscular injections [10]. Inflammatory features like reddish discoloration of skin, swelling, fluctuation test was absent. As suggested by the history that the patient developed above complaints following IM Injection, so the case was diagnosed as NS. On analyzing the *laxana*

(signs) we came to an Ayurvediya diagnosis as *Kotha* (gangrene) and accordingly treatment was planned [7,8].

### 5. Therapeutic intervention

The treatment was focused considering the history, stage of *dosha* (*bodily humors*) the indicated treatment principle for *Kotha* i.e *Chedana karma* (Fig. 1b) followed with *Vrana shodhana* and *Ropana* (Fig. 1c) was planned along with oral medications [8].

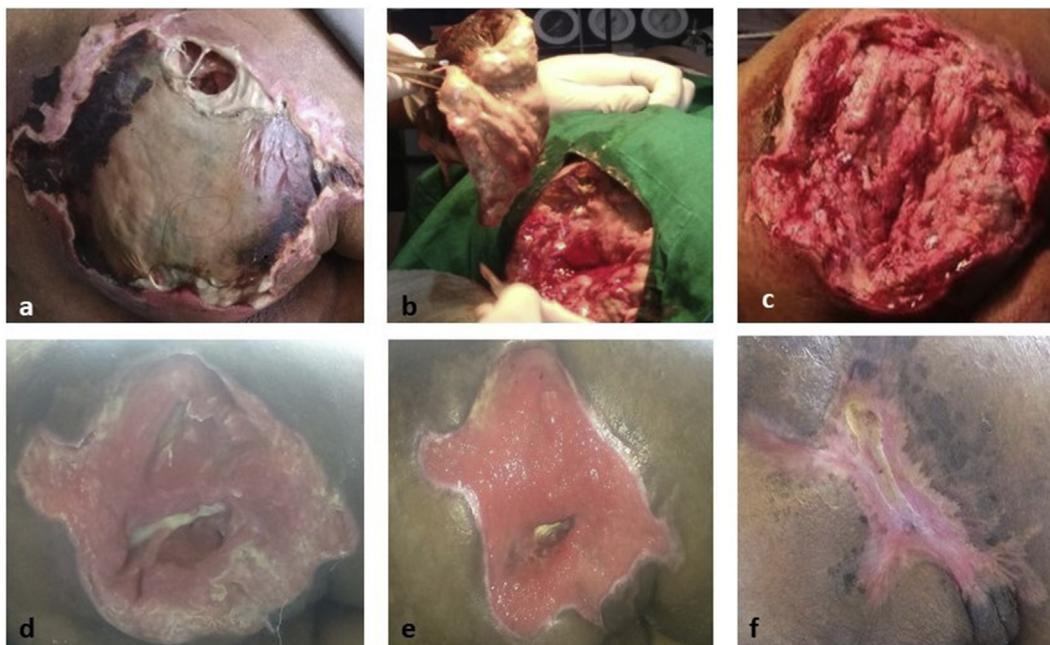
### 6. Follow up and outcome

The patient was discharged on 8th day (Fig. 1d) and wound assessment was done on every 3rd day up to 10 days [Table 2] later it was assessed on every 5th day (Fig. 1e) until wound healing. Blood and urine investigations were done after 1 month, HB % was 10 gm% and rest other values were under normal limits. The wound took 1month for complete healing with mild contracture (Fig. 1f).

### 7. Discussion

First case of NS was encountered in nineteenth century [11]. Standard management protocols do not exist currently for this rare clinical syndrome. Published articles reveal that approach towards the management of NS entirely depends on the presentation which involves both conservative and surgical excision of necrosed tissues [12]. In the present case patient was on regular Intramuscular injection for pain relief from Osteoarthritis. Ayurveda classics explains *Samprapti* (pathogenesis) of *Kotha* is due to *Margavarana* (encapsulation) and *Dhatu Kshaya* (depletion of tissue). The word *Marga* refers to channels within the body which carries nutrients and *Avarana* means obstruction. The Pathological probability of *Kotha* may be accumulation of morbid *Kapha* and *Pitta Dosha* within the channels which obstructs the *gati* (moment) of the *Vata Dosha* leading to death of tissue [13].

On the basis of clinical manifestations, the *Sampraptighataka* (Components of disease pathogenesis) were assessed as *Kapha*



**Fig. 1.** Therapeutic Interventions (a) Wound On 1<sup>st</sup> Day (b) Wound During *Chedana Karma* (Debridement) (c) Wound on 1<sup>st</sup> day dressing (d) Wound at Discharge (e) Wound at first follow up (f) Second follow up Wound healed with contracture.

**Table 1**  
Therapeutic intervention and oral medicines.

Plan of care	Procedure	Duration (Days)							
		1	2	3	4	5	6	7–15	15–30
<i>Chedana</i>	Surgical debridement	✓							
<i>Vrana Shodhana</i>	<i>Prakshalana</i> with <i>Panchavalkala Kashaya</i> and <i>Vimlapana</i> with <i>Jatyadi taila</i>	✓	✓	✓	✓	✓	✓		
<i>Vrana Ropana</i>	Local application of <i>Jatyadi taila</i>	✓	✓	✓	✓	✓	✓	✓	✓
<i>Vrana Bandhana</i>	Bandaging	✓	✓	✓	✓	✓	✓	✓	✓
<i>Cap Pentaphyte P5</i>	500 mg tab	✓	✓	✓	✓	✓	✓	✓	✓
	1 tab three times (morning, afternoon and night) with warm water after food								
<i>Triphala Guggulu</i>	250 mg tab		✓	✓	✓	✓	✓	✓	✓
	2 tab two times (morning and night) with warm water after food								
<i>Aragwadhadi Kashaya</i>	20 mL 3 times (morning, Afternoon and night) with equal quantity of warm water after food		✓	✓	✓	✓	✓	✓	
<i>Chitrakadi vati</i>	250 mg tab		✓	✓	✓	✓	✓		
	2 tab two times (morning and night) with warm water before food								

**Table 2**  
Assessment of various Wound parameters.

Wound parameter	Assessment of parameters in Days							
	1	4	7	10	15	20	25	30
Size	20 × 20 cm	20 × 20 cm	20 × 20 cm	18 × 18 cm	15 × 15 cm	10 × 10 cm	7.5 × 7.5 cm	3.5 × 3.5 cm
Shape	Spherical							
Depth	3.8 cm	3.5 cm	3.2 cm	3 cm	2.3 cm	Transversally oval		
Discharge	Purulent (Pus)		Serous					
Edge	Sloping							
Floor	Necrosed tissue	#PGT	#PGT	#PGT	#RGT	#RGT	#RGT	#RGT
Odour	Foul smell ( <i>visra gandha</i> )							

PGT – Purulent discharge with unhealthy granulation tissue. RGT – Red Healthy granulation tissue.

*pitta dosha* with *kleda* (discharge) predominance, *Sanga* (obstruction) as *srotodushti* (vitiation of channels), accordingly the treatment was planned. *Chedana* is one among eight surgical procedures and it is indicated in *Kotha*, *Bhagandar* (Fistula in ano), *Granthi* (tumour), etc. [8]. *Chedana* was done without using anesthesia as there was no pain due to necrosis of tissue. *Panchavalkala kashaya* was used for wound toileting, it possesses *SheetaVeerya* (cold potency) thus helps in reducing pain and *Daha* (burning sensation) in post-operative period [14]. *Kashaya Rasa* (astringent taste) possess *Kleda* (discharge) *Shoshana* (absorption) and *Lekhana* (scraping) properties, recent researches claims its Anti-inflammatory, Analgesic and Antimicrobial properties (against *E coli*, *S. aureus*, *Pseudomonas aeruginosa*) [14]. *Vimlapana* (gentle massage around the wound) helps in reduction of *Shopha* (inflammation) and helps in the process of wound healing. In *Vimlapana karma* [Table 2] uniform pressure is exerted over the wound which increases local temperature and relieves vasoconstriction thus enhancing micro and macro circulation at the wound area. Improvement in local blood circulation, enhances oxygen and essential nutrient transport, combating the anoxic condition of the wound and eliminating the local stagnated toxins, inflammatory mediators thus accelerates healing process [15]. Proprietary medicine Pentaphyte P – 5 capsules comprises an extract of *Ficus bengalensis* (*Vata*), *Ficus glomerata* (*Udambara*), *Ficus religiosa* (*Ashwatha*), *Ficus lacor* (*Plaksha*), *Albizia lebec* (*Shirisha*). Phytosteroids are the key components possessing immunomodulator, Anti-inflammatory and Antimicrobial action [16]. Recent researches prove Analgesic, Antibacterial, Antimicrobial and free radical scavenging properties of *Triphala Guggulu* [17]. *Chitrakadi vati* has *Agni deepana* (improve digestion) action so it was administered as patient complained loss of appetite [18]. *Aragwadhadi kashaya* possesses *kapha dosha hara* property and indicated in management of skin diseases and wound, studies have proven its Antibacterial, Antimicrobial, Antiparasitic and Anti-inflammatory properties [19].

*Jatyadi Taila* is known for its wound healing nature and it is widely used in treating various non-healing ulcers, it possesses both *vrana Shodhana* and *Ropana* properties. Ingredients of *Jatyadi Taila* has *Kashaya* (astringent), *Tikta* (bitter) *rasa* and *Laghu* (lightness), *Ruksha* (dry) *Guna* (quality). *Karanja* (Pongamia oil tree), *Haridra* (Turmeric), and *Jaati* (jasmine) are known for their *Kush-taghana* (alleviates skin diseases) and Antimicrobial property, thus preventing the wound infection. *Tutha* (CuSo4.7H2O) does *Vrana Lekhana* (scraping) and helps in getting rid of slough tissues. *Tila Taila* (Sesame oil) does *vrana shodhana* and helps in better penetrating of drugs thus enhancing pharmacological action [20].

Complications of NS include contractures and deformities resulting from scarring in cases of extensive tissue loss [21]. In the present case she was advised for skin grafting as the wound area was extensive, but the patient refused because of fear and economical condition which resulted in minimal wound contracture after complete healing (Fig. 1f).

## 8. Conclusion

Nicolau syndrome is an uncommon iatrogenic ischemic necrosis of the skin and deeper tissue. The wound in the present case took one month for complete healing with scarring and deformity. Wound debridement in early stage and oral medications with proper dressing has given good surgical outcome.

## 9. Informed consent

Informed consent regarding documentation and publication of the case was obtained from the patient.

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None.

**Conflict of interest**

None.

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