

REASONABLE AND SCIENTIFIC APPLICATION OF PIGEON'S EXCRETA IN THE CURE OF ACUTE ABSCESS

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ABSTRACT: Surgery has its sound existence from the ancient times, its evidences are there as in the form of Surgical Papyrus (Edwin Smith's Papyrus) reflects the features of the Egyptian Medicine (1700 B.C.). Sushruta Samhita a source of Ayurveda also shows the surgical practice in the early Christian era. Later on in the medieval period many doctors of Greco Arabic medicine earned the fame in this field. The leading surgeons are Abul Qasim Zahravi, Ibn-al-Quf. Ancient Mesopotamian, Egyptian, Greek, Roman, and Indian, physicians agreed that animal excrement has valuable medical uses. Herophilus, founder of the great medical school in Alexandria early in the third-century BC, introduced camel dung and camel urine into Greek medicine. The hugely influential Greek physician Galen used pigeon excreta in wound dressings. Primeval Unani scholars like Jalinoos & Ibne Sina categorized the diseases in three forms viz, *Sū' Mizāj*, *Sū' Tarkīb*, and *Tafarruq-i-Ittiṣāl* (Discontinuity). Acute abscess is an inflammatory condition (*Maraz Murakkab*), which has three fates: (1) *Taḥallul* (Resolution), (2) *Taqayyuh* (Suppuration), (3) *Taḥajjur* (Fibrosis). *Khurāj Hād* (acute abscess) is *Maraḍ Murakkab* due to presence of all three types of *Maraḍ*. Definition of *Khurāj* in Unani medicine is that an inflammatory swelling filled with pus and accompanied with redness and pain. Usool e ilaj of abscess is *Tasfiya* and *Tanqiya*. For this *Mufajjir-i-Awrām*, *Muṣaffī* and *Munaqqi Advia* were being used to wipe out *Khilṭ e Fasida* from the cavity, and to help the body to heal the wound. There is a scientific approach behind the use of pigeon's excreta which was used as *Mufajjir-i-Awrām* as it is highly acidic in its white part which helps in the opening of abscess. Today there are chemicals which are being used to change the physiological conditions by altering the pH like Magnesium sulfate topical, Sulphacetamide Sodium topical and Urea topical. *Tasfiya* and *Tanqiya* of Abscess are now done by incision and drainage along with antibacterial, anaesthesia and analgesics drugs. Pigeon poop's chemicals and their role will be discussed in this paper.

Index terms: *Sū' Tarkīb*, *Ilāj bi'l yad*, *Khurāj*, Pigeon's excreta. Abscess, Unani

Introduction

Since very ancient times, Surgery (*Ilāj bi'l yad*) has always been a element of treatment in Unani System of Medicine. Surgery is an primeval medical area of expertise that uses operative manual and instrumental techniques for investigation and/or treatment pathological condition, to improve bodily functions or appearance or to repair unwanted ruptured area (for example, a perforated ear drum). Unani physicians were pioneers in surgery and had built-up their own instruments and techniques. They practiced surgery and wrote many significant books, for instance *Kitab-al-Tasrīf* by Abul Qasim Zahravi, *Kitab-al-Umda fil Jarahat* by Ibn-al-Quf, *Kamil-us-San'a* by Ali Abbas Majoosi etc. An Arab Unani physician, Abul Qasim Zahravi, wrote a book entitled *Kitab al-Tasrīf li-man 'ajza 'anit -Ta'leef* with illustrations of surgical instruments, consisted of 30 volumes on medicine, surgery, pharmacy and additional health sciences. The last volume of the book has 300 pages, is devoted to only Surgery. He treated Surgery as a separate subject for the first time in the history of Medicine. He described a number of procedures, inventions, and techniques, including tonsillectomy, tracheotomy, craniotomy, thyroidectomy, extraction of cataract, removal of kidney stones, caesarian section, dentistry etc. ⁽¹⁾ In ancient times, Unani surgeons did perform several surgeries like brain surgery, laparotomy and plastic surgery. They were master in general and local surgical procedures in accordance to equipment and technology present at their respective times. In Unani System of Medicine, certain categories of drugs are used in cases where surgical interventions are needed. *Dafa-e-Ta'affun Adwiya*: (Antiseptic drugs) - Cinnamomum camphora (Kaafoor), Azadirachta indica (Nīm), Santalum album (Sandal) etc. *Haabis-e-Dam Adwiya*: (Styptic drugs)- Alum (Shibb Yamānī), Quercus infectoria (Māzū), Polygonum bistorta (Anjibār) etc. *Mudammil-e- Qurooh Adwiya*: (Wound healing drugs) - Dracaena cinnabari (Dam al-A khwayn), Soap stone (Sang Jaraahat), Red Ochre (Gerū) etc. *Mukhaddir Adwiya*: (Anaesthetics)-Datura innoxia (Jawz al-Māthil), Hyoscyamus alba (Ajvā'in Khurāsānī), Lactuca sativa (Kāhū) etc. *Musakkin-e- Alam Adwiya*: (Analgesics)- Colchicum autumnale (Suranjaan), Syzygium aromaticum (Qaranfal). *Khaatim Adwiya*: (Cicatrizants)- calcified shell (Sadaf Sokhta), Slaked lime (Aahak Maghsool), Nummulite (Shadinaj) etc. *Mufajjir-i-Awrām*: birds dropping, pigeon's dung, alsi, arand etc. *Mundij-i-Awrām*: (concoctus of swelling) daqaiq e kundur , zift, khatmi, alsi. ⁽¹⁵⁾

Abscess

Background Infections have always been a main complication of surgery and trauma and have been acknowledged for 4000–5000 years. The Egyptians explained some concepts about infection as they were able to prevent putrefaction, testified by mummification skills. Medical and surgical papyruses also depict the use of salves and antiseptics to prevent infections. This 'prophylaxis' had also been known earlier by the Assyrians, although less well documented. It was described again independently by the Greeks. The Hippocratic teachings shows the use of antimicrobials, e.g., and vinegar, which were widely used to irrigate to open infected wounds before delayed primary or secondary wound healing. A credence common to all these civilizations, and indeed even afterward to the Romans, was that, whenever pus localized in an infected wound, it is needed to be drained. Galen recognized that this localization of infection (suppuration) in wounds, inflicted in the gladiatorial arena, predominantly after drainage (*pus bonum et laudabile*). Sadly, this dictum was misunderstood by many later healers, who thought that it was the

production of pus that was desirable. Until well into the Middle Ages, some practitioners promoted suppuration in wounds by the application of noxious substances, including *bird's faeces*, in the misguided belief that healing could not occur without pus formation. Theodoric of Cervia, Ambroise Paré and Guy de Chauliac observed that clean wounds, closed primarily, could heal without infection or suppuration. The understanding of the causes of infection came in the nineteenth century. Microbes had been seen under the microscope, but Koch laid down the first definition of infective disease. Koch's postulates do not cover every eventuality though. Organisms of low virulence may not cause disease in normal host but may be responsible for disease in immune compromised host. Some hosts may develop subclinical disease and yet still be a carrier of the organism capable of infecting others. Louis Pasteur recognized through his germ theory that micro organisms were responsible for infecting humans and causing diseases. Joseph Lister applied this knowledge to the reduction of colonizing organisms in compound fractures by using antiseptics. ⁽²⁾

The concept of a 'magic bullet' (*Zauberkegel*) that could kill microbes but not their host became a certainty with the discovery of sulphamide chemotherapy in the mid twentieth century. The discovery of the antibiotic penicillin is certified to Alexander Fleming in 1928, but it was not secluded for clinical use until 1941 by Florey and Chain. The first patient to receive penicillin was Police Constable Alexander in Oxford. He scratched the side of his mouth while pruning roses and developed abscesses of the face and eyes leading to a severe staphylococcal bacteraemia. He responded to treatment, made a partial recovery before the penicillin ran out, then relapsed and died. Since then, there has been a proliferation of antibiotics with broad-spectrum activity and antibiotics today remain the mainstay of antimicrobial therapy. The overture of antibiotics for prophylaxis and for treatment, together with advances in anesthesia and critical care medicine, has made possible surgery that would not previously have been considered. Fecal peritonitis is no longer inevitably fatal, and incisions made in the presence of such contamination can heal primarily without infection in 80–90 per cent of patients with appropriate antibiotic therapy. Despite this, it is common practice in many countries to delay wound closure in patients in whom the wound is known to be contaminated or dirty. Waiting for the wound to granulate and then performing a delayed primary or secondary closure may be considered a better option. ⁽²⁾

An abscess is enclosed collection of liquefied tissue, which is called pus. It results in defensive system to foreign material. An abscess shows all the clinical features of *acute inflammation* explained by Celsus: **calor** (heat), **rubor** (redness), **dolour** (pain) and **tumour** (swelling). To these can be added **functio laesa** (loss of function). They usually follow a puncture wound of some kind, which may have been forgotten, as well as surgery, but can be metastatic in all tissues following bacteraemia. Pyogenic organisms, predominantly *Staphylococcus aureus*, cause tissue necrosis and suppuration. Pus is poised of dead and dying white blood cells that release damaging cytokines, oxygen free radicals and other molecules. Abscess is surrounded by an acute inflammatory response composed of a fibrinous exudate, edema and the cells of acute inflammation. Granulation tissues (macrophages, angiogenesis and fibroblasts) form later around the suppurative process and lead to collagen deposition. If it is not drained or reabsorbed completely, a chronic abscess may result. If it is partly sterilized with antibiotics, an antibioma may form. Abscesses contain hyperosmolar material that draws in fluid which increases the pressure and results in pain. They spread usually track along planes of least resistance and point towards the skin. Wound abscesses may discharge spontaneously but may need drainage through a surgical incision. Most abscesses relating to surgical wounds take 7–10 days to form after surgery. Abscess cavities need to be cleaned out after incision and drainage and are traditionally expectant to heal by secondary intention. Antibiotics should be used if the abscess cavity is closed after drainage, but the cavity should not be closed if there is any risk of retained loculi or foreign material.

In a chronic abscess, lymphocytes and plasma cells are seen. There is tissue sequestration and calcification may occur later. Certain organisms are linked with chronicity, sinus and fistula formation. Common ones are *Mycobacterium* and *Actinomyces*. They should not be forgotten when these complications occur and persist.

Unani system of medicine describes the stages of diseases which are four in number: onset, increment, acme, and decline. These are distinct from the phases of health. Each stage can be detected by senses, and each has its own characteristic signs. So, abscess shows the same stages too:

1. The onset (Ibtidā-i-Maraḍ) is that period of time during which the disease is becoming manifested, and its characters are commencing to develop. There is no evident change in degree.
2. The increment (Tazayyud-e-Maraḍ) is the period during which the degree of illness is hourly becoming more and more decided.
3. The acme (Intihā-i-Maraḍ) is that period during which all the characters of the illness have become manifest and remain so.
4. The decline (Inhīṭaṭ-e-Maraḍ) shows abating of the signs of illness: and the further this period advances, the more nearly is there freedom from the symptoms of the diseases. ^(5,6,7)

Primeval Unani scholars like *Jalinoos & Ibne Sina* categorized the diseases in three forms viz, *Sū' Mizāj*, *Sū' Tarkīb*, and *Tafarruq-i-Ittiṣāl* (Discontinuity). There are three fates of inflammation (1) Taḥallul (Resolution), (2) Taqayyuh (Suppuration), (3) Taḥajjur (Fibrosis). Khurāj Hād (acute abscess) is Maraḍ Murakkab due to presence of all three types of Maraḍ. Definition of Khurāj in Unani medicine is that an inflammatory swelling filled with pus and accompanied with redness and pain. Asbāb e-Khurāj Hād are Dam, Ṣafrā, any matter which is Har bi'l Jauhar and all that infectious matter which possess Hot Temperament. Usool e ilaj of abscess is *Tasfiya* and *Tanqiya*. For this *Mufajjir-i-Awrām*, *Muṣaffi* and *Munaqqi Advia* were being used to wipe out *Khilṭ e Fasida* from the cavity, and to help the body to heal the wound. ^(4, 5, 8)

For acute abscess astringent repercussives must be purely cold in temperament. But if the swelling is cold the remedies must be combined with something possessing a heating property in addition to being astringent. During the stage of maturation, the retentive quality of the treatment must be kept down, and it must be combined with something resolvent. When the height has been reached, the two classes of remedy may be given in equal proportions.

Acute abscesses were being used to treat by the promotion of maturation which helps to bring about the result. Sometimes maturation and incision must be done together. ⁽²⁾

Maturation is favored by the use of an agent which both obstructs and agglutinates, for in this way the heat of the part is maintained. In carrying out such measures one should watch to see when the innate heat is feeble or the tissues are breaking down. At that moment the agglutinative remedy must be removed and medicine given, making a deep incision. After that, re-solvent and desiccative medicines are to be applied which we shall specify in the special part. ⁽²⁾

Importance of pigeon dropping:

Ancient Mesopotamian, Talmudic, Egyptian, Indian, Roman and Greek physicians approved that animal excrement has valuable medical uses. Herophilus, founder of the enormous medical school in Alexandria early in the third-century BC, introduced camel dung and camel urine into Greek medicine. The hugely influential Greek physician Galen used pigeon dung in wound dressings. Not merely a curiosity of primitive cultures, medical use of excrement (*dreckapotheke*), like blood-letting, existed within well-developed, scholarly medical knowledge. In ninth-century Baghdad, Bakhtīshū`, of the illustrious Bakhtīshū` family of Abbasid royal physicians, turned to mixed bird droppings in a medical emergency. He treated severe colic pain of a patient with the help of kept that person into a large drinking pool full of water, which was now heated by the sun, and the birds had left their droppings in it. The physician called for coarse salt and ordered it to be thrown into the pool and dissolved in the water. He then ordered a funnel and made the man drink it all, while he was still unconscious. He told us to stay away from him, and indeed he evacuated abundantly from the upper and lower parts. But, after several days, to our great astonishment, he recovered. ^(11, 12, 13)

Pigeon poop, or guano, is extremely nitrogen rich making it an excellent source of fertilizer for early humans. The use of pigeon guano as fertilizer continued throughout history up until the development of agribusiness that resulted in cheaper more efficient means of fertilizer's. Additionally, pigeon poop contains a compound called saltpetre which is one of the three major ingredients in gunpowder. *Saltpetre* was extracted from the pigeon guano and mixed with charcoal and sulphur to make the gunpowder, a necessity in warfare after the advent of the gun. There is mention that in 16th century England, the pigeon was the only source of saltpetre which gives pigeons a huge role in the combative abilities of the English during this time period. The high levels of ammonia in their native species of pigeons' droppings make them useful in the tanning of leather. In agriculture and gardening guano has a number of uses, including as: soil builder, lawn treatments, fungicide (when fed to plants through the leaves), nematicide (decomposing microbes help control nematodes), and as composting activator (nutrients and microbes speed up decomposition). ⁽¹⁰⁾

The natural pH of pigeons is shown to vary based on the bird's age as well as reproductive stage. The influences of the altered diet between the rock dove (the wild progenitor of the feral pigeon) and the feral pigeon are detailed, indicating that the human-based diet of rock dove excreta. This higher acidity is due in part to diet, but also to potential increases in faecal and/or uric acid volumes due to the low quality of human-based diets. Bird droppings are known to contain salts; *phosphoric, nitric and uric acids*. Pigeon excrement rich in *organic matter and phosphoric acid*. It also contains uric acid, which through "putrid fermentation" turns into ammonia-rich compounds. Normal urine in birds is made up of uric acid precipitates and crystals (uric acid dihydrate) as well as various salts. The greater the acidity of the deposited substance, that is, the lower the pH, the greater the impact observed on susceptible materials. Uric acid has been associated with the decay of structure. Urea is used to treat dry skin conditions for example eczema, psoriasis, corns, callus and some nails problems e.g., ingrown nails. It may also be used to help remove dead cells in some wounds. Urea is known as keratolytic as it increases moisture in the skin by softening/dissolving the horny substances (keratin) holding the top layer of skin cells together. This effect helps the skin fall off and helps the skin keep more water in. ⁽¹⁰⁾

Early chemical analyses (in %) of pigeon dung ⁽¹⁰⁾

Element	Element	Macadam (1888)		Schulze (1895)	Grimme (1931)
Water	H ₂ O	56.08	58.32	21.00 (3.80–40.00)	50.50
Organic matter		18.35	26.50		30.50
Crude ash					17.50
Ammonia (nitrogen)	NH ₃	1.21	1.75	2.53 (1.47–5.04)	1.75
Phosphate	P	2.69	2.54		
Calcium carbonate & C. sulphate	CaCO ₃ / CaSO ₄	3.80	1.75		
Phosphoric acid	H ₃ PO ₄			1.79 (1.00–2.77)	1.79
Potassium oxide	K ₂ O				1.00
Calcium oxide	CaO				1.65
Potash				1.46 (0.71–2.57)	
Alkaline salts		0.82	1.99		
Silica and sand		17.92	7.00		
N		1	1	40	

Discussion

Aim and objective to discuss the above knowledge regarding acute abscess is to validate the practice to heal and cure acute abscesses aids with respect to time. The Unani physicians were best thinker and innovative who use to genesis the new facts and theories which were applied in the respected areas and followers of Ṭib have to walk on that base. At that time it was assumed that if an abscess has occurred then its fate in the form of suppuration is necessary which was then evacuated and the cavity was packed with the local administration of drugs followed by irrigation. Physicians had to wait to suppurate the abscess if the patient is in stage of increment. Otherwise in the stage of onset the treatment was use of anti-inflammatory drugs to suppress the abscess. To suppurate and make the abscess soft or to open its tip from where pus can be wiped out, so many ways were there in the form of drugs, regimen, and dietary modifications. If we take the list of drugs which were use for this purpose few examples which can be seen in Unani classical literature easily are *Allium Sativum* Linn (Garlic), *Zift*, Sulphur (Kibreet), Honey,

Brassica Nigra (black mustard), verdigris (zangar), bird's poop like pigeons, baaz dropping etc. ⁽⁵⁾ Except birds dropping rest drugs can be easily analyzed on their pharmaceutical constituents and action but when we say that birds dropping can be used to breakout the skin over abscess and it promotes the suppuration, listeners use to laugh and take the scientific approach of Tib as unscientific.

Therefore, pigeon's dropping is taken in this talk to analyze its composition and the mode of action on skin over the abscess and matter beneath the skin. It alters the environment needed for tissue viability and alters pH which is required for intact skin due to presence of *uric acid* along with *Ammonia (nitrogen)*, *Phosphate*, *Calcium carbonate*, *Calcium sulphate*, *Phosphoric acid*, *Potassium oxide*, *Calcium oxide*, *Potash*. Nowadays to do the same chemical compositions are available like magnesium sulphate, incision and drainage then done when it seems suppuration is at peak. And in initial stage there are now antibiotics and anti inflammatory drugs available which checks the stage of suppuration.

Conclusion:

The gist of this article is to light up the scientific approach of pigeon's excreta in the treatment of acute abscess by analyzing the constituents of the dropping and their chemical and physical effects on the acute abscess. It can be easily concluded that in ancient time, the practitioners were very advanced and had the knowledge of their fields.

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