The effect of Makka Mud Packs (MMPs) treatment on lipoma and sigmoid polyp: Two case reports and invention.

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Abstract: Aim: The effect of Makka Mud Packs (MMPs) treatment on lipoma and sigmoid polyp: Two case report and invention Material and methods: Makka soil Al- sail way -Al-kaekea area- Jazan Road - KSA after rain. was chemically analyzed, It was full of elements, ions and heavy metals which included: CO3, HCO3, SO4, Cl-, Fe, Cu, Zn, Na+, K+, Cd, Mn, Ni, lead Pb, MMPs were prepared by mixing soil from Makka with tap or Zamzam mineral water. MMT was applied on two cases: one female aged 43 years suffered from swelling under the left ear Diagnosed as: BENIGN LIPOMA which was surgically removed after decrease of its size from 10cm to 4.5cm size after MMP treatment. Case 2 was male patient aged 45 years, suffered from pain in the gluteus region. Diagnosed as sigmoid polyp: Tubulovillous adenoma with focal marked dysplasia (carcinoma in situ) Invasion of any, cannot be detected. For strict follow up: polypoid measuring:1.5 before MMP and reduced to 1,2 cm after MMT. Results: Combined (MMT) lead to DECREASED size of lipoma and sigmoid polyp after MMT. Conclusion: MM from, Al sail way-KSA- was analyzed and used for the first time in lipoma and polyp (MMT) could be predicted to act as adjuvant complementary enhancing management for lipoma and sigmoid polyp before surgery. Further controlled studies are needed. Summary of the invention: These Methods Are Non Invasive methods using pre-prepared Makka Mud (MM) for complementary or alternative management of some diseases or health problems. These methods involved the administration of (MM) after its preparation by mixing the purified soil of Kaekea area from Makka -The Sail WAY after dried from rain -KSA to get a semisolid form or gel. MM will be spread on various sized cotton sheathes, or wraps, or strips, or plaster, or pack on different body areas, or applying 200-400mg MM inside cotton or semi cotton or nylon gloves or sox for rheumatic hands or carpal tunnel syndrome or rheumatic feet according to the disease: Also provide a kit or article of manufacture containing MM pre-prepared (frozen) or in the solid virgin soil form accompanied by instructions for use of health problems. MM can be put in bucket booklet? or capped vessel or tubes or made of plastic of various sizes, or glass jars or wooden box. The kits could be put in separate forms or accompanted with Zamzam water. Video or CD or USB illustrating the way how to apply MM besides the instructions MM can be administered beside some information's on the mechanism of action of (MMT). [Manal G. Abd El Wahab and Salwa Sager, The effect of Makka Mud Packs (MMPs) treatment on lipoma and sigmoid polyp: Two case reports and invention. Life Sci J 2018;15(12):8-14]. ISSN: 1097-8135 (Print) / ISSN: 2372-613X (Online), http://www.lifesciencesite.com. 2. doi:10.7537/marslsi151218.02.

Key words: Makka –Mud – therapy –Packs-lipoma-polyp **Abbreviations:** Makka Mud Therapy = MMT MMP: Makka Mud Packs -MMPs

1. Introduction and back ground

Ancient Egyptians new the curable efficiency of mud therapy. Kleopatra had done mud bathes to acheave health and beauty specially for the skin at the shore of white sea in a place is still known after her name in Marsa Matrooh shore in Eygypt. (Kleopatra bath).

East Europe used mud therapy using the black sea. The dead sea in Jorden was reported to be a place for mud therapy because of its high ion concentration.

Later in the eighteenth century Rasha, Okrania and Turky were famous for treating pain spine

stiffness and mobility after trauma and spondylarthritis and wound healing after wars.

Nowadays many therapeutic and beauty centers of mud therapy were founded in many countries in Rassa, Okrania, Turky and countries around the dead sea as well as in Yeman and Oman. Commercialized mud therapy around the Black Sea coast of Bulgarian were rich of sulphurous mineral spring.

It was mentioned in the Holy book of Muslims in the Quran, many ayat and also in Ahadith of the prophet Mohamed BPUH that Allah the most merciful the most graceful had created the first human Adam from different forms and stages of mud which originally formed from soil and water: Allah created the first human Adam from soil, mud, mud which can act like glue (mentioned in Quraan by the word lazeb) and Allah created human from (salsal) changed black hard mud witch when knocked can produce sound. In another ayat, the human being were created from water.

In AL Asfahani book that explained the meaning of wards of Quraan; mud was formed from mixing the soil with water and other tafasser al Galaleen and Ezz Abd Salam, salsal which was the unit formation of human and that meant by many explanations of Quraan: the hard mud which changed without touching fire and had a sound when knocked on.

- The explanation (tafseer) Mohammed Al Ameen bin Mohammed bin Mukhtar Janki Shankiti Dar Al Fikr Publishing Year: 1415 AH / 1995 AD.
- The verse 14-15: Creation of man from clay as pottery: Surat el RAHMAN.

The clay: the dry clay that you hear a clink, any sound if it was knocked on by something, and it is said: clay clay, pottery clay cooked, It was documented that the therapeutic influence of various types of mud was due to their physical, chemical, thermal effects and the content of elements as minerals, ions, and organic contents. Mud because of those active biological contents had anti-bactericidal effects, immunostimulating,, anti stress which affected cortisol body levels and had electrical effects which affected health problems and help cure. Many researches focused on that mud therapy boosted bodily exchange processes, purified, rejuvenated, revitalized, moisturized and increased microcirculation effect, and had analgesic effects and could enhance health well being and quality of life. Mud qualities differed in different areas on earth, according to their own environment, and then influential therapeutic effects. Maeda et al., 2017 proved Clinical and anti-aging effect of mud-bathing therapy for patients with fibromyalgia, and Antonelli and Donelli . 2018 reviewed Effects of balneotherapy and spa therapy on levels of cortisol as a stress biomarker.

Researches pointed out that there were varius types of mud according to their mineral and ion and organic contents and the area of mud:

Mud which was found in superficial bays of salt water lakes, lagoons and, mud of the deep sediments of sweet water pools and sprigs, besides mud of the deep sediments of salt water and mud which was found after volcano's. They differed in their organic and ionic content and their curable efficiency.

Scientist classified therapeutic mud according to their biochemical basses of interpretation of biological and therapeutic action to: thermal mud Curri etal., (1997), Physicochemical characters, peloid Mihelcic et al (2012), mud bath Bazzichi et al., 2013 and

balneotherapy (Karaguille, Karaguille 2015, Verhagen et al., 2015, Saalbach, et al., 2016)).

• It was documented that Peloid was a mud used therapeutically. Peloids were as various as their different sources. They were formed from the ingredients found in their immediate vicinity – humus (plant matter) and minerals that had combined and formed over many years by biological and geological, physical and chemical processes. Peloids came from, lake mud, sea mud and plant substances. They have been used medicinally in Europe in the form of packs, wraps and baths for hundred years. Lately Metin Ökmen et al., proved (2017) effectiveness of PELOID therapy in carpal tunnel syndrome: a randomized controlled single blind study. Int J Biometeorol. doi: 10.1007/s00484-017-1317-1

TE REVIEW of literature showed that there was no study on the therapeutic efficiency of Makka mud on lipoma and sigmoid polyp The aim of the present work is to illustrate the effect of Makka Mud Packs (MMPs) treatment on lipoma and sigmoid polyp: Two case reports and put forward invention design methods besides suggesting new art of manufacture and kits for Makka mud (MM) preparations to be used in therapy.

2. Material and Methods: Makka Soil Analysis:

Analysis of Makka SOIL: after rain at the sail way - Al kaekea- Jazan Road-KSA. That soil was specific to certain climatic, topographical and geological influences.

And the Makka mud (MM) was formed by mixing tap water or mineral water Zamzam.

Analysis of MM showed the high content of minersls especially Calcium AND MAGNESIUM Ca+4.80Mg+3.40.

Sues Canal University, College of Agriculture by the Head of the Department Prof Dr. Mohamed Ahmed Nasr.

Soil Analysis of Makka soil- after rain that was taken from AL sail way –Al kaekea- Jazan Road - KSA. (Table 1) and was full of elements, ions and heavy metals which included CO3, HCO3, SO4, Cl-, iron Fe, cobalt, Ni, copper Cu and zinc Zn, Na+, K+, Cd, Mn, Pb.

3. Results

Examples for Pateints Were Treated With (MMT).

Patient case 1: Female patient aged 43 years.

Symptoms: swelling under the left ear.

Medical Diagnosis: BENIGN LIPOMA which was surgically removed after decrease of size after MMT

Regime of treatment: MMT, MEDICAL PLANTS HENNA AND OLIVE OIL.

MMT: Use Makka Mud Pack (MMP) on the left cheek of the face seven times per day, olive oil three

times 3tds, and one time plant application on the swollen part for months.

(Table 1) SOIL ANALYSIS OF Makka after rain Al kaekea Jazan Road-KSA shows the presence of the elements and cations and trace substances. Concentration unit/mg/L

Element	Fe	Ni	Cd	Pb	Cu	Mn	Zn
	38.2886	1.6809	0.0018	0.1842	1.2701	13.4979	2.4517

No	EC dSm	ph	Cations meq-1				anions	anions meq-1-			
4	2,16	7,85	Ca+	Mg+	Na+	K+	C1-	HCO3	- CO3	3-2 SO4	
			4.80	3.40	12.93	0.87	9.50	2.60	0.00	9.90	
No	No T.N ppm		T.I	T.P ppm		T.K ppm		%O.M			
4	4 175		Tra	Trace		240		0.2905			

Investigation: complete blood analysis, sonar.

Disease progress:

Surface area of the swelling substance under the ear pinna:

On day 28-1-1432 hijri:10 cm.

On day 26-2-1432 hijri: 8 cm.

On day 27-3-1432 hijri: 7 cm.

On day 15-10-1432 hijri: 6 cm.

On day 25-6-1433 hijri: 4.5 cm.

Patient case 2:

Symptoms: male patient aged 45 years.

Diagnosis: sigmoid polyp: Tubulovillous adenoma with focal marked dysplasia (carcinoma in situ) Invation of any, cannot be detected. For strict follow up.

The diagnosis was by Prof Dr NADER Dahaba in Alex university EGYPT and LABORATORIES in Dr Erfan and Bagedo General hospital KSA.

Gross description: Received in formalin labelled sigmoid polyp, it consisted of grayish —white polypoid soft tissue measuring 1,2 cm. Bisected and submitted into to one cassette.

Regime of treatment:

Use Makka Mud Pack (MMP) on the pain area and upper back of the thighs from the day 20-12-1431 Hijri four times daily continued for one month.

MMT, plant and olive oil applied on the pain area plus external and general antibiotics therapy.

Investigation: complete blood analysis showed normal heamogram for the age and sex, sonar.

Disease progress:

Measures of the sigmoid polyp before MMT combined with plants and oil seen by the sonar:1-5cm. Measures of the sigmoid polyp ater MMT combined with plants and oil was 1-2cm.

4. Discussion

In the present study examples, in The case 1: using MMP for months on left cheek caused decrease in the size of lipoma under the ear before surgical

excision from 10cm to 4.5cm. The case 2 using MMP for one month on the upper back of the thigh and the gluteal region enhanced decrease in the size of the polyp of sigmoid colon from 1-5cm to 1,2cm. The decrease in the two swellings might be due to anti inflammatory anti edemic and antitoxic effects, besides increased the efficiency of the immune system and because of the pysical and chemichal properties of MM as MM analysis showed it contained the high contents of minerals, ions which were beneficial for cells, tissues, organs and body systems. The results of the present study were in accordance with Bellometti, et al. (2005), Bellometti et al., (2008), Jokić (2010) et al., noted (2002), Güngen et al., (2012), Cozzi et al., (1995) and Bellometti et al., (1997).

In the present study decreased size of the lipoma in case 1 and decrease size of the ppolyp in case 2 might be due to the effect of Mkka Mud (MM) as changes of body enzymes, serum receptors of tumor necrosis factor and changes in Oxidative stress, hemoglobin content. the results of the present study were in accordance with Bellometti, et al. (2005). Who reported that mud was capable of Production of matrix metalloproteinases and their inhibitors in osteoarthritic patients undergoing mud bath therapy Mud pack treatment of osteoarthritis patients changed in serum levels of cartilage disease markers Bellometti etal., (2008), Jokić (2010) et al., reported changes in Oxidative stress, hemoglobin content, superoxide dismutase and catalase activity that were influenced by sulphur baths and mud packs in patients with osteoarthritis. Bellometti etal., noted (2002) that both serum receptors of tumor necrosis factor were influenced by mud pack treatment in osteoarthrotic patients. Güngen et al. (2012) reported that the influence of mud pack therapy on serum YKL-40 and hsCRP levels in patients with knee osteoarthritis. Cozzi et al., (1995). pointed out the changes in Hypothalamic-pituitary-adrenal axis dysregulation in healthy subjects undergoing mud-baths applications.

Bellometti et al., 1997 noted changes in serum levels of chondrocyte markers.

Mud-pack therapy in osteoarthrosis

In the present study MM analysis showed the high contents of minerals and ions needed for body health and had the curable effects on health problems. MM analysis showed (Table 1) the precence of Calcium, Magnesium Mg+and Sulphur carbonate CO3and HCO3, sulphate SO4, Ca+, chloride Cl-, and trace minerals, iron Fe, cobalt, nickel, copper Cu and zinc Zn, Soduim Na+, potassium K+, cadmium Cd. Manganese Mn, nikal Ni, lead Pb,.

The results of the present study were in accordance to Bartram who said about Calcium, Magnesium and Sulphur: "Calcium combines with protein to give structural solidarity to bones and flesh. Given with benefit to all bone problems, delayed union after injury, brittleness in the elderly, delayed dentition and weakness in rapidly growing children. Cataracts. Rickets in children. Muscle cramps, spasms, tremors, nervousness, insomnia and joint pains. Bodily effects include healthy teeth and bones, blood clotting, nerve and muscle resilience.

"Magnesium is an important mineral. Essential for use of vitamins B1 and B6, a deficiency of which affects the nervous system. Vasodilator. Platelet inhibitor. Deficiency may lead to disorders of arteries and kidneys: brittle bones, pre-menstrual tension, heart disease, muscle cramps, hypoglycaemia, insomnia, palpitation, tremor of hands or lower limbs; anorexia, anxiety, depression, tiredness, dizziness, confusion. Studies reveal that two thirds of patients with peripheral vascular disease are magnesium deficient. Absorption is blocked by the contraceptive pill, a high milk or fat intake. Chronic fatigue syndrome. Heart attack. It enables the co-ordination of nerves and muscles. Healthy teeth and bones. This metal activates more enzymes in the body than any other mineral, carbonate, sulphate, chloride, bromide, fluoride and carbon. To name but a few of the trace minerals iodine, aluminium, iron, cobalt, nickel, copper and zinc.

In the present study MM analysis showed the high contents of useful minerals and ions needed for body health. MM analysis showed (Table 1) the precence.

The results of the present study were in accordance to Jump et al., 2006.

The results of the present study the two cases had improvement of body function after MMP and decreased pain. That might due to the direct effects of MMP. The results of the present study were similar to Fioravanti et al., 2011 who pointed that Mud-bath therapy increases plasma β -endorphin levels and secretion of corticotrophin, cortisol, growth hormone and prolactin. It has recently been demonstrated that

thermal mud-pack therapy induces a reduction in the circulating levels of prostaglandin E2 (PGE2), leukotriene B4 (LTB4), interleukin-1ß (IL-1ß) and tumour necrosis factor-α (TNF-α), important mediators of inflammation and pain. Spa therapy has been found to cause an increase in insulin-like growth factor-1 (IGF1), which stimulates cartilage metabolism, and transforming growth factor-\u03b3 (TGFβ). There is also evidence of the positive action of mud-packs thermal baths and on oxidant/antioxidant system, with a reduction in the release of reactive oxygen (ROS) and nitrogen (RNS) species.

The results of the present work was similar to Reshetova et al., 2004 who reported that mud had analgetic, antiedematic, antiinflammatory actions and promoted normalization of systemic immunity and peripheral hemodynamics.

Mud modified nitric oxide, myeloperoxidase and glutathione peroxidase serum levels in arthritic patients and beta-endorphin and stress hormones in patients affected by osteoarthritis by reducing inflammation, pain and therefore diminished the cause of stress Giacomino et al., 2007.

M Mud Packs could produced improvement in Muscle tone and decrease pain intensity can be positively progressed due to the direct effects of MMP. The results of the present study were similar to Giannitt et al., 2008 who stated that Spa therapy was one of the most commonly used non-pharmacological approaches for many rheumatic diseases. In Fibromyalgia Syndrome (FS) it might be useful for the chronic wide spread musculoskeletal pain. Because of the unknown etiology and the not clear understood pathogenesis, there was no standard therapy regimen for FS. Also the mechanisms of action of spa therapy were not completely known, but most probably the benefits could be derived from mechanical, physical and chemical factors. Muscle tone and pain intensity could be positively influenced by mud packs and thermal baths.

What can the Mud Do Summary pf

It was reported that the moistness of the peloid mud relaxed the skin, opening the pores. That allowed impurities to be drawn out affecting a deep cleanse. At the same time nutrients were absorbed from the mud. As the mud dried the skin is tightened, and circulation of blood and lymph increased, accelerating the exchange process. The skin benefited from the mud; and the increase in circulation delivered nutrients already in the body, like oxygen. Impurities in the tissues, if not drawn out of the skin, were flushed away to the other organs of excretion; nutrients that had been absorbed through the skin were transported around the body to where they were needed. That removal of impurities and the double delivery of

nutrients were rejuvenating for the skin, and the rest of the body as well. The skin will function more efficiently.

Conclusion

Conclusion of case reports: MMT caused decrease size of lipoma and decreased in size of sigmoid polyp before surgical excision. MMT could be regarded as efficient in complementary therapy of lipoma and polyps.

Summary of the invention:

THESE MOTHODS ARE NON INVASIVE methods using pre-prepared Makka Mud (MM) for complementary or alternative management of some diseases or health problems. These methods involved the administration of (MM) after its preparation by mixing the purified soil of Kaekea area from Makka -The Sail WAY after dried from rain -KSA to get a semisolid form or gel. MM will be spread on various sized cotton sheathes, or wraps, or strips, or plaster, or pack on different body areas, or applying 200-400mg MM inside cotton or semi cotton or nylon gloves or sox for rheumatic hands or carpal tunnel syndrome or rheumatic feet according to the disease: Also provide a kit or article of manufacture containing MM preprepared (frozen) or in the solid virgin soil form accompanied by instructions for use of health problems. MM can be put in bucket booklet? or capped vessel or tubes or made of plastic of various sizes. or glass jars or wooden box. The kits could be put in separate forms or accompanted with Zamzam water. Video or CD or USB illustrating the way how to apply MM besides the instructions.

MM can be administered beside some information's on the mechanism of action of MMT.

Detailed Discription of The Invention:

Soil of makka mud which was formed after rain fall in JAZAN road El kaekea- Sail way KSA.

- A- Dry Soil of makka area which formed after rain fall in JAZAN road- El kaekea- Sail way KSA.
- To be put in buckets of different sizes and separate bottles of Zamzam water could be used after mixing them forming semi solid mixure to be used in room temperature. Then to be ready for use. exposure to sun and moon light outdoors in open air exposure FOR 24 hours after.
- B- Mud preparation was formed from Makka soil, mixed with tap water in the room temperature to be semisolid to form mature mud or peloid as mentioned before in A.
- C- Different compressors strips, cotton or semicotton or nylon sheathes of different size and spread the mixure prepared of MM.
- C- Stored frozen Pre-prepared Makka Mud MM: (Makka peloid) could be pre prepared and saved in

frozen state to keep the organism in static situation. then used when needed. and could be portable.

- 1- Pre-prepared (MM) COULD BE PUT IN PLASTIC TUBES of different size.
- 2- Pre-prepared (MM) cotton or packs of different size.
- 3- Pre-prepared (MM) plaster mud plaster tapes of different size.
- 4- Pre-prepared (MM) cotton, **muslin** or semi cotton compressors of different size.
- 5- Pre-prepared (MM) cotton, **muslin** or semi cotton bandages of different size.
- 6- Pre-prepared (MM) cotton. **muslin** or semi cotton strips and sheathes of different size.
- 7- Pre-prepared (MM) cotton, **muslin** or semi cotton or nylon gloves and sox of different size. filled with 200 -400mg MM.

What is claimed are:

- 1. Provide Dry Soil From Makka Area Kaekea- Road Of Sail –Jazan- Ksa. Could Be Saved In Plastic Tubes Accompanied By Separate Water Miniral Holy Water Zamzam Or Tap Water.
- 2. Dry Soil From Makka Area –Kaekea- Road Of Sail –Jazan- Ksa. Could Be Put In Sheathes Plastic Or Nylon Or Cotton And Separate Plastic Bottles Of Zamzan Holy.

Water Or Tap Water.

- 3. Preprepared Mm In The Form Of Plasters, Bandages, Compressors. Kept Frozen. And Ready For Use.
- 4. Preprepared Mm In The Form Of Plasters, Bandages, Instruction Method Design To Prepare And Use **Makka Mudpacks (Mmp)**

Mud therapy could be used in two forms

- Mud Packs: That involved application of packs of mud.
- Mud Baths: This involved application of special kind of mud rich in natural salts and mineral over the entire body (except head). Mud baths were useful in many skin diseases such as Urticaria, Psoriasis, leucoderma.

Mudpack

• Mud packs: used for local application. The construct and usage of a mudpack was similar for all applications on the thickness and the size varies as per the usage. To make a mud pack first soak the soil from Makka area of Kakea – Sail way –Jazan way -KSA in tap water or Zamzam mineral water to form semi solid mixture or gel like MM preparation using wooden spatula, then leave the prepared MM mixture for 24 hours exposed to moon light and sun light. Then take a thin cotton or **muslin** sheath or cloth and apply Makka mud evenly on the cotton or muslin cloth to form a uniform thin layer of half to one cm in thickness. Fold all the sides to make it a compact pack.

- Makka Mudpack for Eyes: M Mud as prepared in the former step (OR Makka Mudpack MM could be spread directly) on eye lids and forehead. The pack is typically 20cm X 15cm in, enough to cover eyes completely. it is placed on the eyes for 20 to 30 minutes. An eye mud pack helps in relaxing the eyes; after long hours siting t in front of a computer.
- Therapeutically, helped in correcting refractive errors like short/long sightedness and night blindness. Special muds were reported to be effective in Glaucoma, where it works to reduce the eye ball tension. it reduces irritation, itching or other allergic conditions such as conjunctivitis and hemorrhage of the eye ball.
- Makka Mudpack for Head: A head mud pack is normally a thick narrow band. It is applied over the fore head and helps to heal congestive headache relieves pain immediately. Or form a head cap like application on the head after its complete shave for hours and repeat frequently daily for weeks or month for head trauma and hydrocephaly as complementary therapy.

Makka Mudpack for Face: Fine mud is used for face and a smooth paste is first made using tap or Zamzam water. Apply this paste evenly on the face and leave if to dry for 20 minutes. After 20 minutes one must thoroughly wash the face with cold water. It helps in improving the complexion of the skin. In toxins from the skin. It was reported as rejuviniging and in reducing dark circles around the eyes.

- Makka Mudpack for Abdomen: The size of a mud pack for abdomen is generally25cm X 18 cm X2,5cm for adults. The mud pack should be applied for 20-30 minutes. The body and the mud pack should be covered with blanket, if applied during the cold weather. An abdomen mud pack helps in all kinds of indigestion. It is very helpful in decreasing intestinal heat and stimulates peristalsis.
- Makka Mudpack for the back: The size of a mud pack for the back is generally 30cm X 20 cm X4cm for adults.
- Makka Mudpack for thigh: The size of a mud pack for the thigh is generally 15cm X 10 cm X3cm for adults.
 - Makka Mudpack for knee:
- Makka Mud for hands: nylon or cotton or muslin gloves are to be filled with Makka Mud MM200-400gm MM with no finger separation.
- Makka Mudpack for Feet: nylon or cotton or muslin gsox are to be filled with 200gn -400 of Makka Mud MM with no finger separation.
- Mud bath: Makka mud MM could be prepared as mentioned above. The mud is then applied to the full body either in lying down or sitting position. Mud is kept for 30 to 40 minutes and be exposed to

sun light, intermittently. The head should always be covered when exposing the body to sunlight. Afterwards, the person should be thoroughly washed with cold and transfer to a warm bed. A mud bath helps in increasing the blood circulation and energizing the skin tissues. It thus helps in cleansing and improving the skin condition generally. Regular mud baths improve skin by reducing spots and patches, and can manage some skin disorder like chickenpox or small pox. Mud baths are useful in many skin diseases such as Psoriasis, Urticaria, leucoderma, Leprosy and other skin allergic conditions.

NB: over-use of mask applications may lead to excessive drying of the skin. Therefore it is essential to keep the MMP pack moistened to avoid excessive dryness and stretching.

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