

In the Name of God

Idiopathic Granulomatous Mastitis

IGM / GLM

Yearly Congress of Iranian Society of Surgeons
12-16 May 2024

Sadaf Alipour- Tehran University of Medical Sciences



Presentation?
Treatment?

Risk Factors?
Projects?

and...



Retraction

Ulcer

Chronic Erythema

Sense of heaviness

Pain

Anxiety, Depression



Thickening/ Mass

Erythema- Edema



Various treatments
during nearly one year

- + NSAIDs + Prednisolone, low dose
- + Prednisolone, high dose
- + Methotrexate

No response

Antibiotics



Entered in an
approved research
protocol



Healing after 6 weeks

After complete healing:

3 months-follow-up





Imiquimod as a new treatment in refractory idiopathic granulomatous mastitis: report of two cases

Sadaf Alipour^{1,2} · Bardia Gholami^{1,3} · Marzieh Orouji⁴ · Samareh Heydari^{1,3}

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Abstract

Introduction Idiopathic granulomatous mastitis (IGM) is a rare chronic inflammatory lesion of the breast that mimics breast cancer or infection. Immunological pathogenesis is strongly suggested for the disease.

Reason for the report The treatment remains controversial, comprising a spectrum from observation or NSAIDs to immunosuppressive agents and surgery. Intractable cases are not uncommon and represent a major treatment challenge. Therefore in this study, we examine the effect of a topical immunomodulator agent, imiquimod, on refractory IGM.

Case summary Patient 1 had IGM for 9 months and had not responded to the existing treatments. She responded to a 7-week course of imiquimod. In patient 2, the disease had begun 4 months sooner and had been resistant to all treatments; it responded to imiquimod after 4 weeks. Ulcers appeared on the skin of both patients but resolved safely.

Outcome Both patients were very satisfied with the results. Imiquimod can be an appropriate local treatment with limited adverse effects in refractory IGM. We propose similar studies to assess the efficacy of imiquimod in IGM further, paying attention to the possibility of developing skin wounds.

Keywords Benign breast disease · Chronic breast inflammation · Granulomatous mastitis · Imiquimod · Immunomodulators · Local treatment

Introduction

Idiopathic granulomatous mastitis (IGM) is a rare benign chronic breast inflammation with clinical features that include breast lumps, erythema, edema, abscess, fistulas, and ulcers; and may mimic malignancy or breast infections [1, 2]. The strongest etiopathogenic theory considers immune reactions as the main cause, others include steroid hormone imbalances or infectious agents [1].

The diagnosis is by histologic examination of biopsy samples; which shows non-caseating lobulocentric granulomas and multinucleated giant cells. The exclusion of acid-fast bacilli, fungi and parasites is necessary [3].

Treatment remains controversial; some experienced strategies include expectant management, antibiotics, surgical resection, non-steroidal anti-inflammatory drugs (NSAIDs), steroid therapy, or other immunosuppressants. The physician's preference and the clinical features of the disease [1, 2] directs the treatment plan. Refractory cases of IGM are those that remain active despite multiple types of management. There is no recognized therapy for these, and complete response would be defined as diminution of the mass,

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...tion. Immunomodulators are used in the treatment of the breast that mimics breast infection. Immunomodulators are used in the treatment of the disease.

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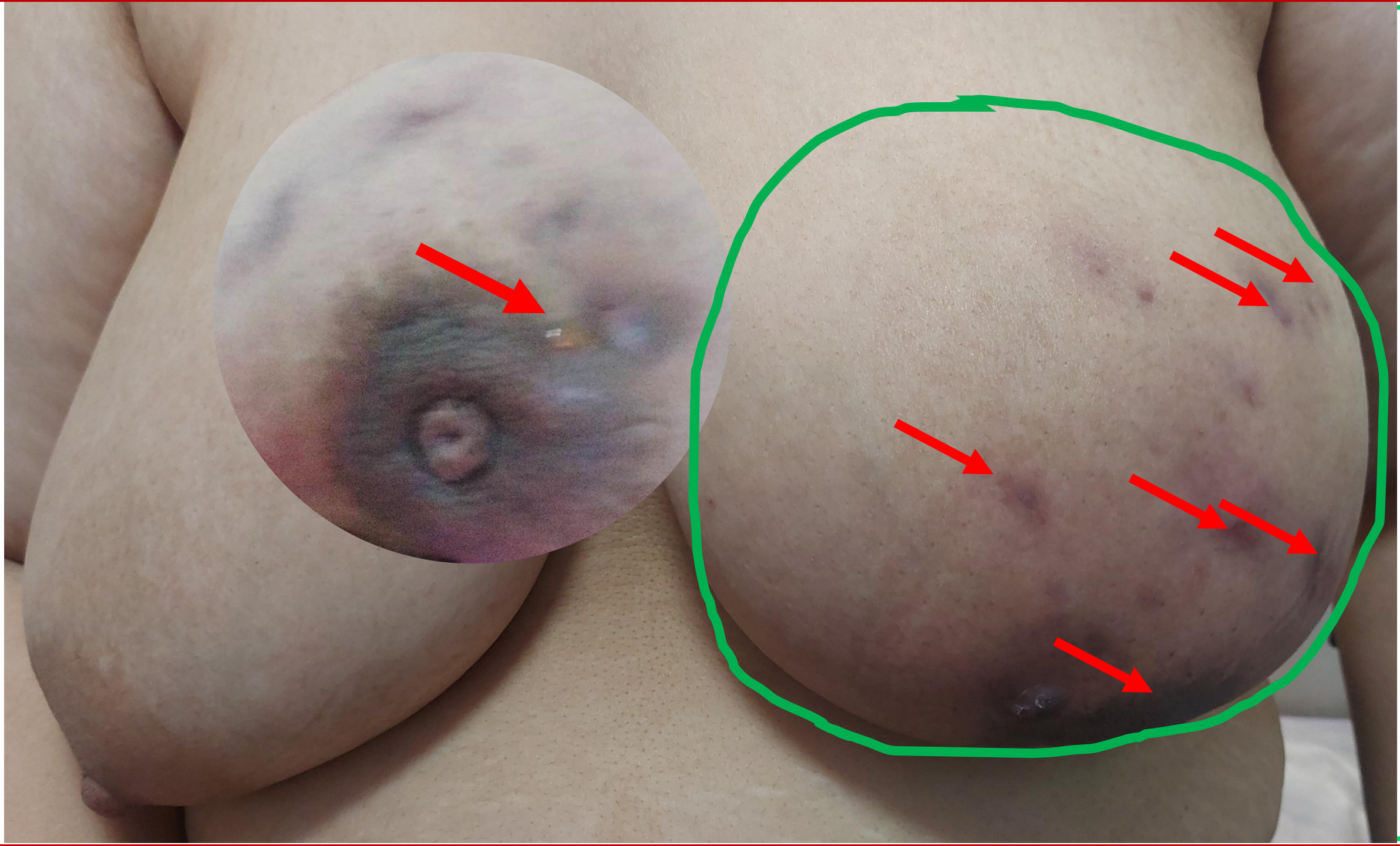
Histologic examination of biopsy sampling showing lobulocentric granulomas. The exclusion of acid-fast organisms is necessary [3].

...ydari
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SIGNS & SYMPTOMS



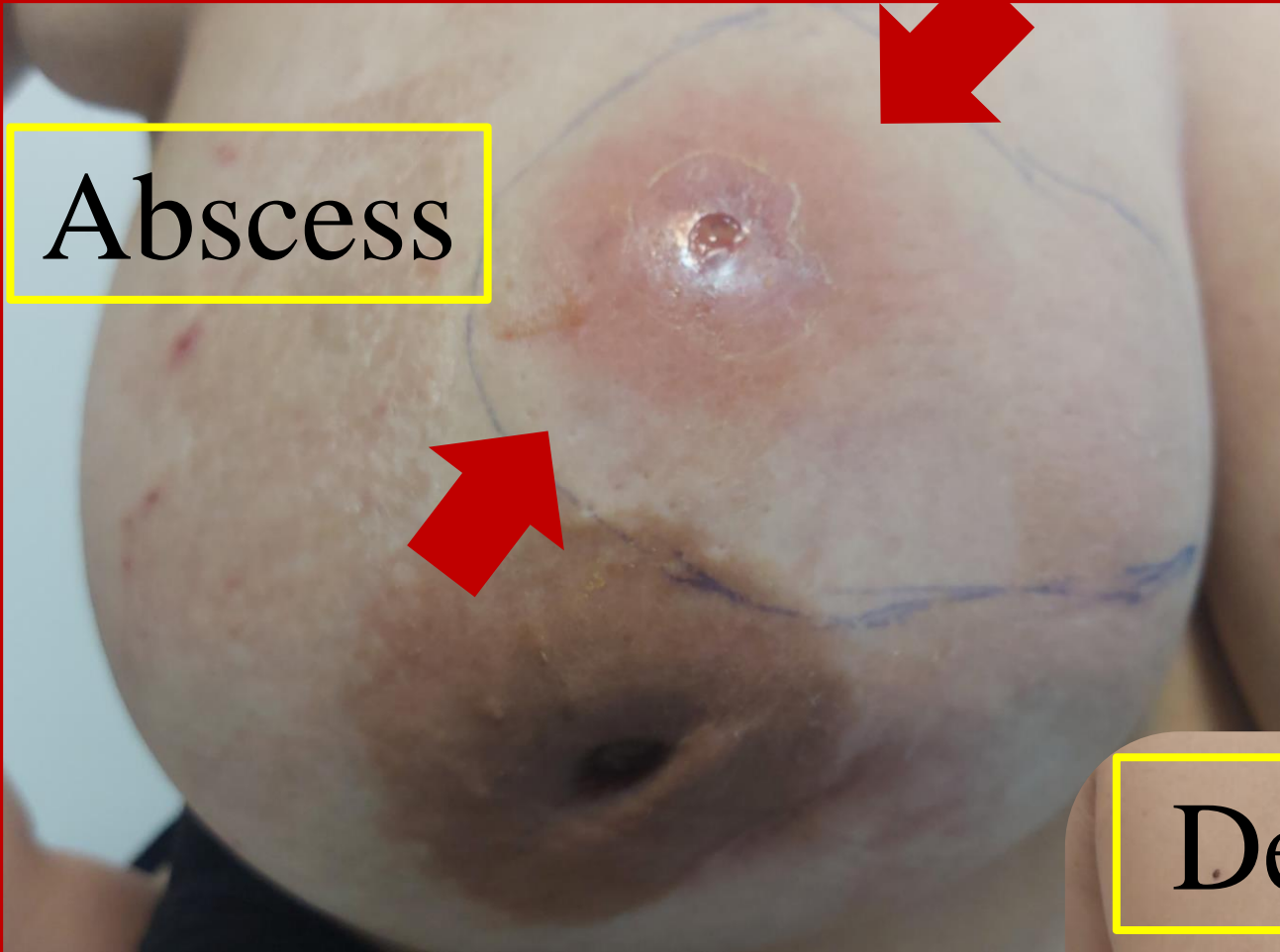
1. Thickening/ Mass
2. Erythema- Edema
3. Ulcer
4. Chronic Erythema
5. Retraction
6. Pain, Sense of heaviness
7. Anxiety, Depression
8.





1. Thickening/ Mass
2. Erythema- Edema
3. Ulcer
4. Chronic Erythema
5. Retraction
6. Pain, Sense of heaviness
7. Anxiety, Depression
8.

8. Fistula
9. Discharge
10. ...
11. ...
12. ...
13. ...
14. ...



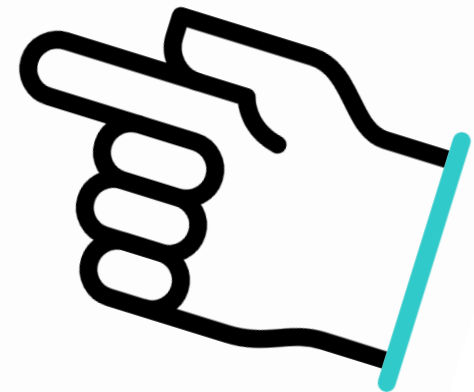
Abscess



Scars



Deformity



SI
G
N
S
&
S
Y
M
P
T
O
M
S



1. Thickening/ Mass
2. Erythema- Edema
3. Ulcer
4. Chronic Erythema
5. Retraction
6. Pain, Sense of heaviness
7. Anxiety, Depression
8.

8. Fistula
9. Discharge
10. Swelling
11. Fluctuation
12. Abscess
13. Scar
14. Deformity
15. *LAP*

1. Thickening/ Mass
2. Erythema- Edema
3. Ulcer

and

8. Fistula
9. Discharge
10. Swelling
11. Fluctuation
12. Abscess
13. Scar
14. Deformity
15. LAP

➤ May around 1/3:

■ systemic symptoms

- *Erythema Nodosum, Arthritis, Episcleritis, fever, general weakness, fatigue, myalgia, ...*



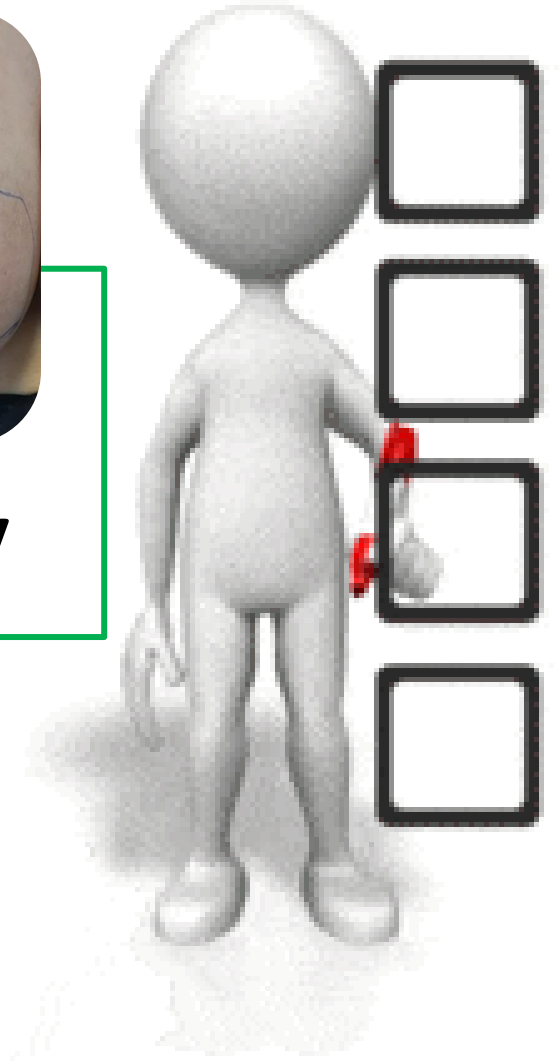
7. Anxiety, Depression
8.

TREATMENT

✓ No Treatment

Only observation;

✓ Aspiration of abscess if any





No Treatm

Only obse



Aspirati



Idiopathic Granulomatous Mastitis (IGM): Clinical Features and Non-Surgical Management

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Abstract

Background: Idiopathic Granulomatous Mastitis (IGM) is a benign disease; it can clinically and radiologically mimic the symptoms of breast cancer.

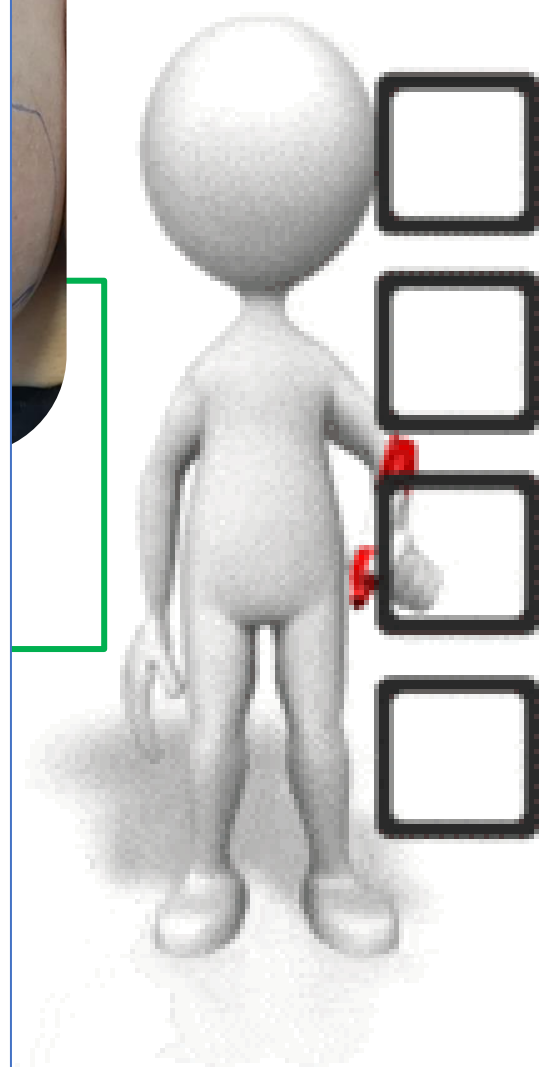
Objectives: Due to the rare and limited number of studies in Iran, this study was designed and conducted to evaluate patients' clinical characteristics and treatment management with IGM.

Methods: In this cross-sectional and retrospective descriptive-analytic study, we studied the medical records of 293 patients with IGM, such as demographic information, characteristics of breast lesions, type of treatment, complications, and their outcome, which were recorded in the Cancer Research Centers of Shahid Beheshti University of Medical Sciences (SBMU) from 2010 to 2019. The patients were contacted by telephone to visit clinically or collect additional information. Data were analyzed by SPSS software version 24.

Results: The mean age of patients was 39.21 (ST = 8.29) years. Breast involvement in 236 cases (80.5%) was unilateral, and in 50 cases (17.1%), the involvement was Peri-pri-Areola. The most common type of treatment was conservative therapy (analgesia + drainage) (178 cases, 60.8%), which was the primary treatment in our study; 66 patients (22.5%) received antibiotic therapy + analgesia + drainage, and 41(14%) cases received corticosteroid in addition to this treatment. Totally, 132 cases (79.5%) were completely cured with the performed treatments, 17 cases (5.8%) had a recurrence of symptoms, and 14.7% of the patients were still receiving treatment. Recurrence after 1 year in patients who had a longer duration of disease (more than 12 months) was higher than in those who had a shorter period (less than 12 months) (15.3% vs. 5.1%, P = 0.004). Also, the highest recurrence rate was in the group receiving corticosteroids compared to the group receiving the usual treatment and usual treatment plus antibiotics. This relationship was statistically significant (22.0% vs. 9% and 6.1%, respectively, P = 0.032). Complications (scar or breast skin color change) were significantly higher in patients without a pregnancy history than in patients who had pregnancy (50.0% vs. 22.8%, P = 0.030). Also, these complications were significantly higher in patients who had a longer duration of disease (more than 12 months) than in shorter periods of disease (less than 12 months) (31.4% vs. 17.3%, P = 0.005).

Conclusions: The results of our study and its comparison with the results of other studies still emphasize the uncertainty of the etiology of IGM disease and its treatment, but to some extent, our study has shown that conservative treatment (drainage with analgesic drugs) is one of the best treatment options. Also, corticosteroid therapy is associated with a higher recurrence rate, but in some cases is necessary and recommended in many studies.

Keywords: Idiopathic Granulomatous Mastitis, Disease, Breast



Akbari 2023: **293 patients, 178 cases observation:**
conservative therapy (analgesia + drainage)

Recurrence in: Conservative therapy: **9%**

AB+ analgesia + drainage: **6%**

AB+ analgesia + drainage + *corticosteroid*: **22%**

✓ Kaviani 2018: **In 374 patients,** the best response was in close observation, **although used in only 19%, mostly mild or moderate disease**

Azizi 2020: **In 474 patients, 15% resolved within 9 months without any treatment**

with the performed treatments, 17 cases (5.8%) had a recurrence of symptoms, and 14.7% of the patients were still receiving treat-

Keywords: Idiopathic Granulomatous Mastitis, Disease, Breast

TREATMENT

✓ No Treatment

✓ NSAIDs ←

Kaviani 2018: 374 patients,
42% treated by NSAID
Naproxen the most common
Duration of use: 18 ± 14 weeks
Complete recovery: 31%
Recurrence: 17%

Mostly:

Naproxen (500, BD)

Celebrex (200, BD)

Ibuprofen, Diclofenac,...



TREATMENT

✓ No Treatment

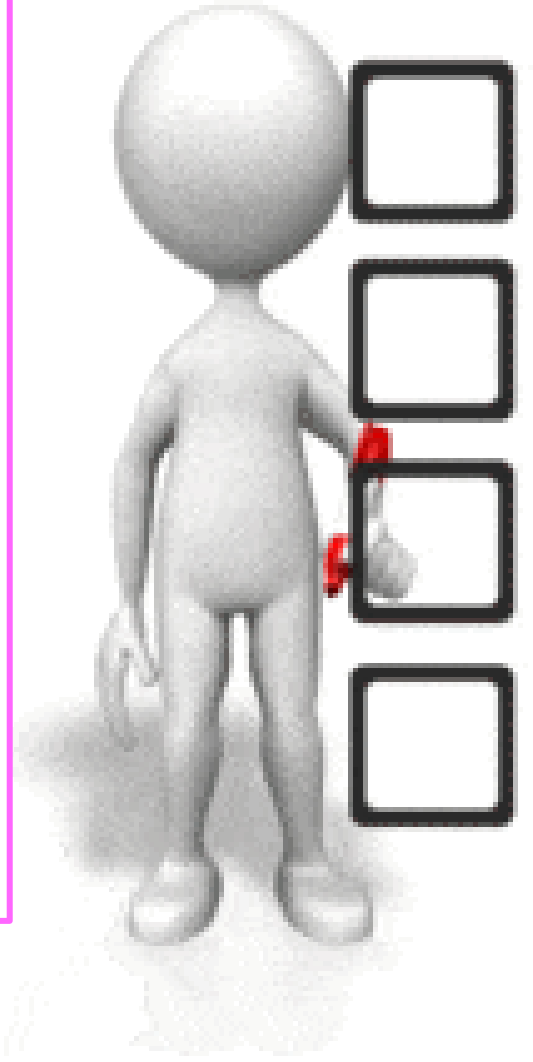
✓ NSAIDs

✓ Antibiotics

Only if actual
infection: abscess

Mostly

- Clindamycin + Ciprofl./Levofl.
- Cotrimoxazole
- Doxycycline
- Clarithromycin
- Cefixime
- ...



TREATMENT

✓ No Treatment

✓ NSAIDs

✓ Antibiotics

✓ Steroids

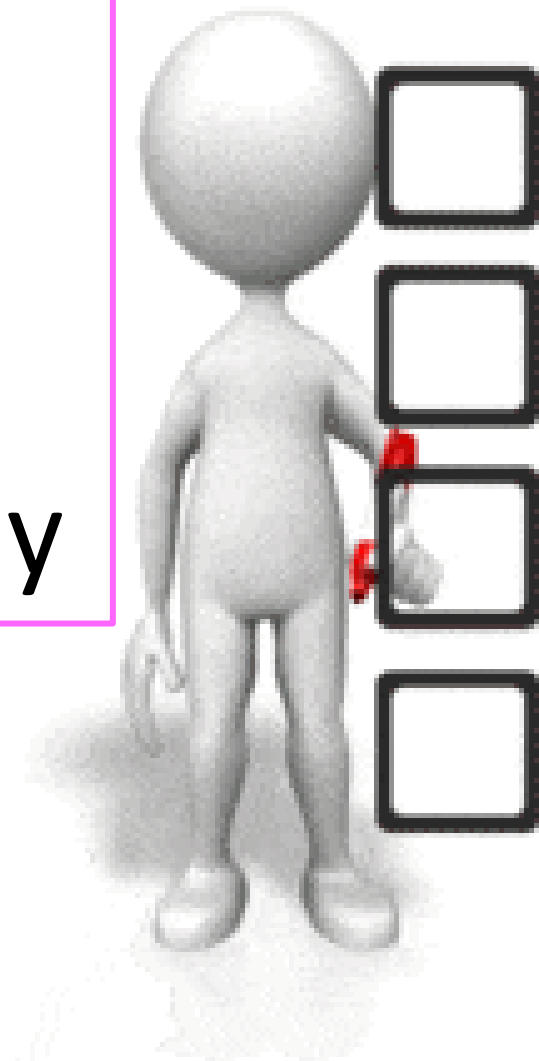
Mostly prednisolone

- Low dose
-5 to 30 mg/day
- High dose
-50 to 60 mg/day

Oral

Topical

Intralesional



TREA

Kaviani 2018: 68% complete or partial response

Recurrence rate significantly high

✓ No treatment

Montazer 2019: 30 patients - 2 months prednisolone;

Low dose, 5 mg daily / high dose, 50 mg daily rapidly tapered

→ High dose group: higher remission and lower recurrence

✓ Antibiotics

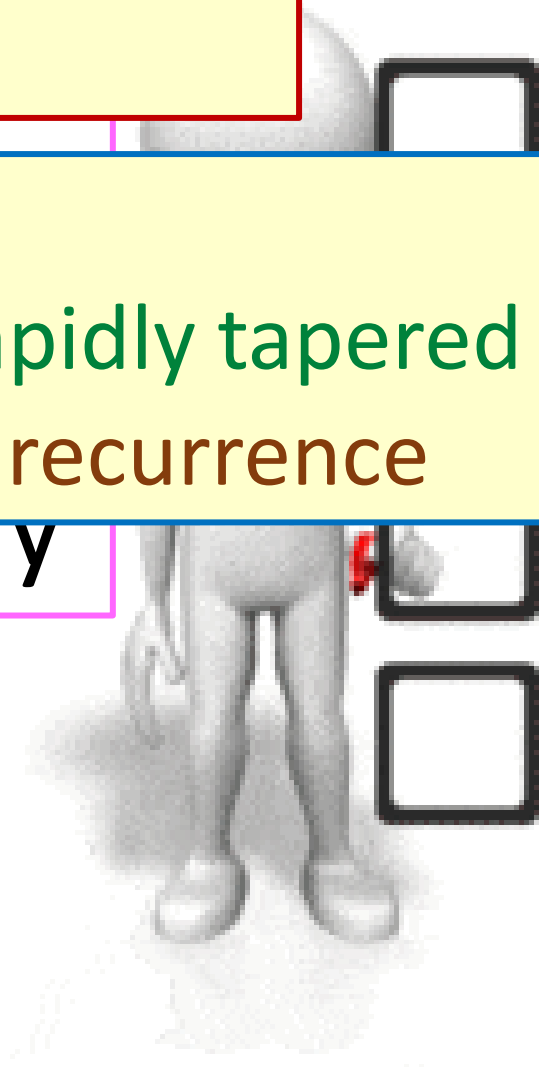
-50 to 60 mg/day

✓ Steroids

Oral

Topical

Intralesional



TREATMENT

✓ No Treatment

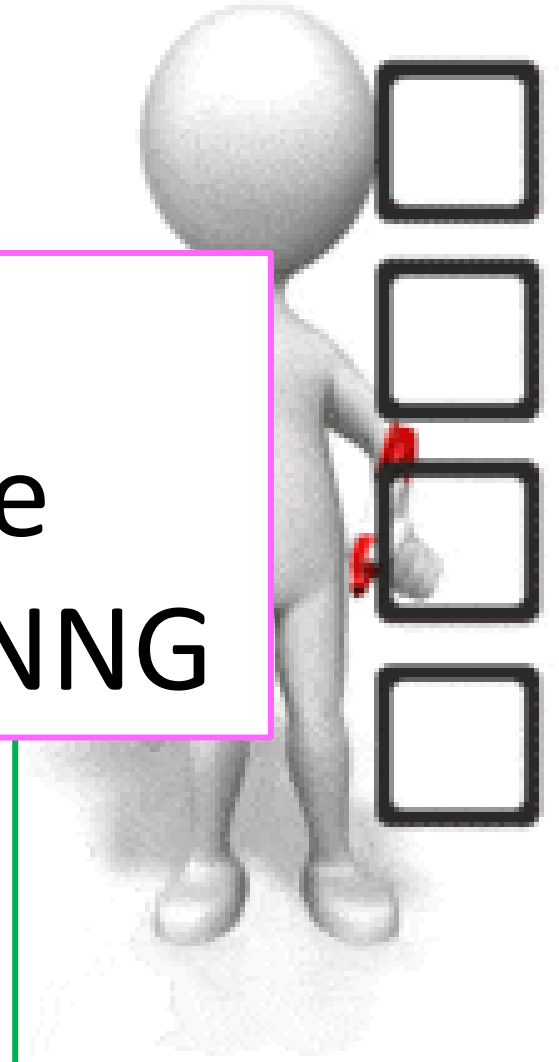
✓ NSAIDs

✓ Antibiotics

✓ Steroids

Mostly

- Betamethasone
- Triamcinolone NNG
- Oral
- Topical
- Intralesional



Cetin 2019: **124 patients**- 3 arms:

42 topical steroids; **42 oral steroids** (*0.8 mg/kg/day*) ; **40 combined**

No difference in response to treatment and recurrence

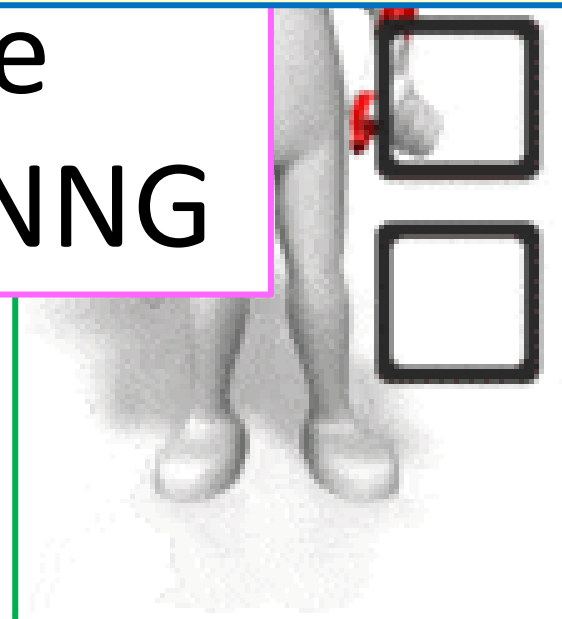
Highest compliance in combined

Lowest side effects in topical but longest duration of treatment

✓ Antibiotics

✓ Steroids

- Betamethasone
- Triamcinolone NNG
- Oral
- Topical
- Intralesional



TREATMENT

✓ No Treatment

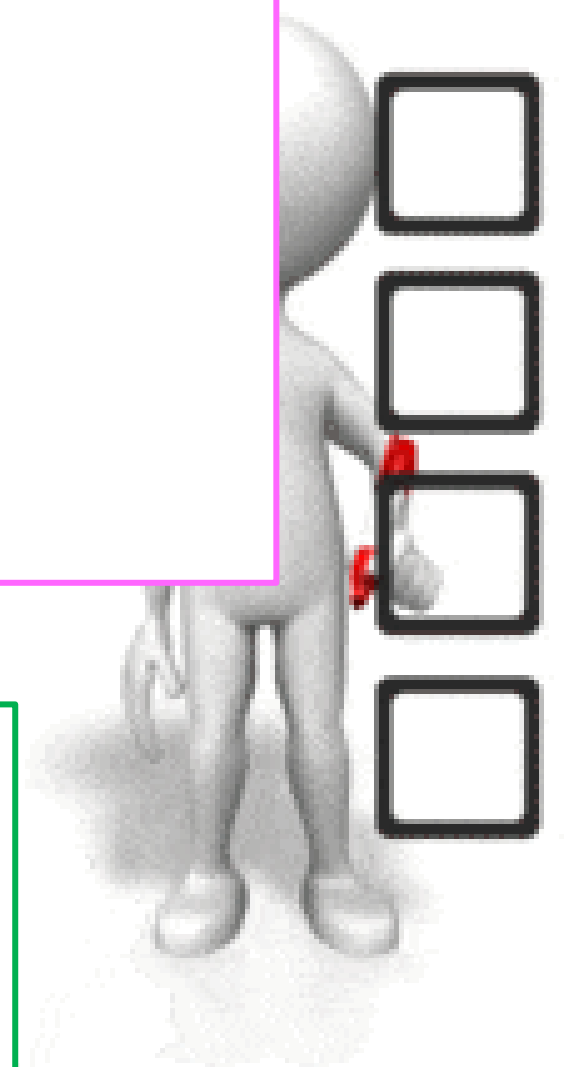
✓ NSAIDs

✓ Antibiotics

✓ Steroids

Mostly
Triamcinolone +
Lidocaine ±
Distilled water

- Oral
- Topical
- Intralesional



TREATMENT

Mostly



No Treatment

Zhang 2024: Systematic review and meta-analysis



8 RCTs, 613 patients

Cases: Intralesional steroid and topical steroid

Controls: oral steroid and surgical treatment



→ local steroid: better response rate, lower side effects

→ No difference in recurrence rate



Steroids

- Topical
- Intralesional

T



Firm to hard mass



4 sessions of intralesional triamcinolone



Soft thickening



y
mcinol
caine =
filled w
ical
ralesic

TREATMENT

Mostly



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Framework and guide for intralesional steroid injections in idiopathic granulomatous mastitis[☆]

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- Topical
- Intralesional

Framework and guide for intraleisional steroid injections in idiopathic granulomatous mastitis^a

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 Idiopathic granulomatous mastitis
 Intraleisional steroid injections
 IGM
 Ultrasound-guided procedure
 Breast diagram

ABSTRACT

Objective: Literature on how to perform intraleisional steroid injections, a valuable therapy for idiopathic granulomatous mastitis (IGM), is limited. This technical note offers a detailed technical guide on intraleisional steroid injections for IGM and provides a framework for long-term follow-up.
Methods: Ultrasound characterization of IGM severity considering breadth, depth, and ancillary findings was used to guide steroid dosing and injection frequency. Clinical and sonographic breast diagrams were designed for accurate longitudinal tracking of IGM. A step-by-step guide for ultrasound-guided IGM aspirations and intraleisional steroid injections was developed.
Results: A detailed approach for ultrasound-guided IGM interventions with clinical and sonographic breast diagrams for longitudinal follow-up is now in practice.
Conclusions: The treatment approach described provides a framework for multidisciplinary treatment of IGM and offers insights that may contribute to the ongoing development and improvement of management strategies for this challenging disease.

1. Introduction

Idiopathic granulomatous mastitis (IGM) is benign but can significantly impact the patient's quality of life due to its protracted course and refractory nature. Treatment options like antibiotics, steroids, and surgery exist, but the optimal approach remains unclear, particularly in refractory cases [1–4]. Ultrasound-guided injectable triamcinolone acetate has shown promise in symptom control and lesion resolution [5,6] and can serve as a bridge to surgery by reducing inflammation and limiting resection [7]. However, specific details on injection techniques and follow-up are lacking, with variability in reported doses and schedules [8,9]. A clinical and imaging framework for managing IGM and a step-by-step guide on ultrasound-guided percutaneous intraleisional injections are provided.

2. Excluding malignancy, classic mastitis, bacterial abscess

For Gram stain, cultures, and sensitivities. Include tests for *Staphylococcus* species, *Corynebacterium*, and *Mycobacterium tuberculosis*, and tailor antimicrobial therapy accordingly if the cultures are positive [10,11]. Biopsy masses for histological confirmation and to rule out malignancy.

3. Breast ultrasound evaluation of IGM severity

Ultrasound of IGM reveals irregular, hypoechoic masses, some with features of complicated fluid, variable debris, and variable acoustic shadowing [11,12,13]. Areas of intervening fatty, ill-defined fibroglandular tissues with non-specific scattered shadowing are also identified. Targeted ultrasound is typically performed at the site of clinical concern, but surveying a more extensive area helps identify additional masses and unaffected regions. The severity of IGM is described based on ultrasound findings, considering breadth, depth, and ancillary features (Fig. 1).

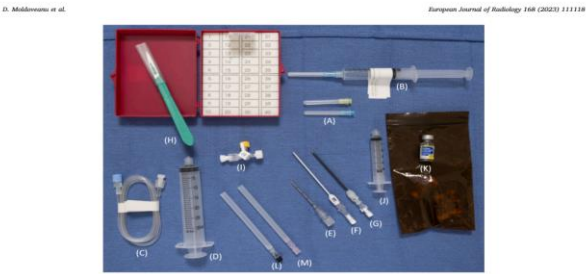


Fig. 3. Basic procedural tray setup for aspiration, possibly followed by steroid injections. Local anesthetic is administered using standard-of-care techniques: (A) 27G and 23G needles and (B) lidocaine 1% buffered with sodium bicarbonate. Aspiration can be performed with (C) a 16G or (D) a 30-g syringe connected to a 16G (not shown) or (E) 15G, 7.0 cm or 7.8 cm long introducer or (F) 30 Fr, 7 cm plastic centesis catheter or (G) an 8 Fr, 7 cm plastic centesis catheter. If a larger aspiration device (E or G) is used, a (H) syringe is used to make a small skin nick. If irrigation is performed with sterile normal saline, a (I) three-way stopcock may be helpful. If steroid injections are performed, a (J) 3-cc syringe may offer better control in distributing the (K) steroid using a (L) 23G spinal needle or a (M) 29G spinal needle. But a 10-cc syringe (not shown) can be used for local anesthetic if mixed with the steroid.

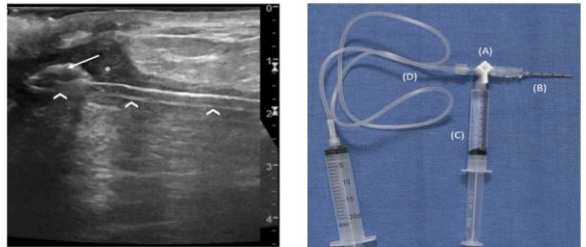


Fig. 4. Aspiration. Consider rotating the needle (chevrons) to get around debris (arrows) within the fluid (*) during an aspiration.

3) **Steroid Injection:** With a 23G spinal needle, direct small boluses (0.1–0.2 cc) of steroid preferentially into the tissue planes immediately adjacent to the fluid collections rather than into the center of the fluid. If needed, injections into the fluid collections should target

the peripheral areas instead of the center (Fig. 7). Plan the treatment session upfront, distributing the triamcinolone volume evenly across all the target lesions.

For patients with skin fistulas, inject around the sinus cavity to prevent injectate loss through the fistula.

mass or area of hairy, ill-defined breast tissue corresponding to symptoms), “multifocal” (multiple ultrasound findings within 5 cm in one quadrant), or “multicentric” (ultrasound findings > 5 cm apart or in multiple quadrants). The depth of involvement includes the ultrasound findings to each anterior-posterior third depth of the breast parenchyma and is denoted as “D1” for superficial-third, “D2” for middle-third, and “D3” for posterior-third involvement. “D1-2-3” signifies full-thickness involvement, while “D2-3” indicates middle-posterior third involvement with relative sparing of the superficial breast tissue. Ancillary features include any nipple-areolar complex or skin involvement, such as fistulas.

4. Clinical and sonographic breast diagrams for accurate longitudinal tracking of IGM

Patients undergo clinical and sonographic evaluations during each visit, with recorded findings on a breast diagram (Fig. 2). The initial evaluation includes symptoms and the results of the physical examination. Areas of pain and tenderness, skin changes, and fistulizing disease are marked with appropriate symbols on the diagram.

Ultrasound findings are shown on a separate diagram, indicating the location of each lesion with clock position, distance from the nipple, and depth within the breast. “M” denotes a mass, and “FC” indicates a fluid collection amenable to aspiration. These parameters are re-evaluated at follow-up appointments, allowing accurate tracking of response to interventions over time.

Ultrasound-Guided Aspiration And Intraleisional Steroid Injections For IGM: A Step-By-Step Guide

Equipment

- A relatively basic procedural tray that allows use to include additional devices is preferred (Fig. 3).
- **Pre-procedure Survey Imaging**
 Unlike typical abscess aspirations, IGM fluid collections often require targeting multiple hypoechoic areas, using the same entry point on the skin. Survey potential areas to aspirate while looking for an access point on non-edematous skin, which can be used for subsequent steroid injections. Sometimes, a separate access point may be necessary, especially with multicentric D1–2–3 involvement. Deeper hypoechoic areas usually yield minimal aspirate, based on empirical observations.

Intraleisional Steroid Injections

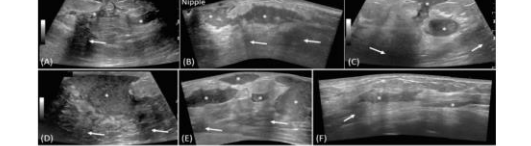


Fig. 5. Irrigation using a three-way stopcock. In some situations, a (A) three-way stopcock connected to the (B) aspiration needle, (C) sterile normal saline, and (D) tubing can be helpful.

	BREADTH	DEPTH	TRIAMCINOLONE (40 mg/ml)
Single	D1	D1	40 mg
Multifocal	D1-2 or D1-3	D1-2 or D2-3	80 mg
Multicentric	D1-2 or D1-3	D1-2 or D2-3	160 mg
	D1-2 or D1-3	D1-2 or D2-3	160 mg
	D1-2 or D1-3	D1-2 or D2-3	200 mg
	D1-2 or D1-3	D1-2 or D2-3	200 mg
	D1-2 or D1-3	D1-2 or D2-3	200 mg
	D1-2 or D1-3	D1-2 or D2-3	Any depth
	D1-2 or D1-3	D1-2 or D2-3	200 mg

Fig. 6. Injectable steroid dosing. The 40 mg of triamcinolone for single, <5 cm, single-depth involvement. The 80 mg of triamcinolone for multifocal, two-depth levels of involvement. The 160 mg of triamcinolone for multifocal, full-thickness involvement or multicentric two-depth levels involvement. The 200 mg of triamcinolone in severe, multicentric full-thickness involvement or ≥ 2 quadrant disease to ensure adequate coverage of all involved areas. The breast maps described in Fig. 2 are used to plan the injection sites and adequately divide the dose across disease sites.

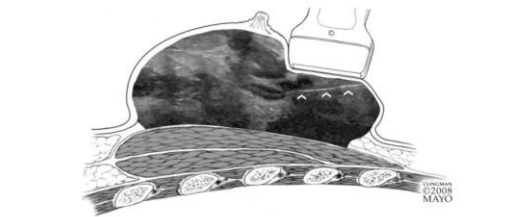


Fig. 7. Steroid injections for IGM. Direct the needle (chevrons) into the peripheral interfaces of the hypoechoic masses and into the ill-defined, hairy fibroglandular planes. Inject steroid into these locations. (Used with permission by Mayo Foundation for Medical Education and Research, all rights reserved. Original image modified by Christine Lee.)

Particular consideration should be given to the ill-defined, hairy fibroglandular planes in the deeper breast tissues (see Fig. 7).

For patients with skin fistulas, inject around the sinus cavity to prevent injectate loss through the fistula.

5. Discussion

This technical note provides a clinical and imaging framework for

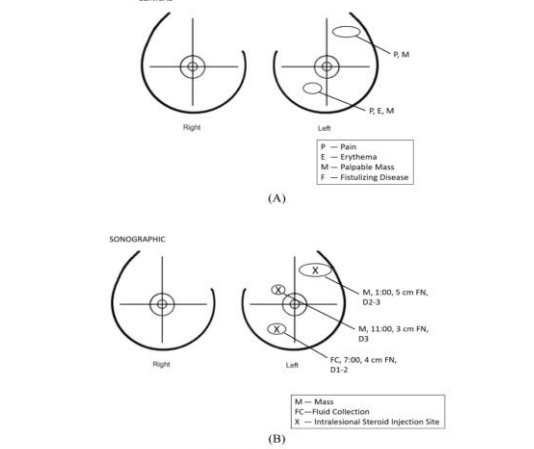


Fig. 8. Clinical and sonographic breast diagrams for the longitudinal follow-up of patients with IGM. Some electronic medical records provide an editable diagram or schematic. (A) The clinical breast diagram shows the areas of pain (P), erythema (E), palpable mass (M), and fistulizing disease (F). (B) The sonographic breast diagram, as a minimum, shows where ill-defined masses (M) or fluid collections (FC) are located and where intraleisional steroid injections (X) were performed to provide comprehensive information at a glance. Additional details such as location and depth of involvement, as shown, can be added, but these are further detailed in the abstract report with the clock position, distance from the nipple (D1), distance of the findings. The breast diagram shows how ICMPC, Verona, WI, USA) can be copied and pasted on follow-up ultrasound exams so that the markings can be modified and do not have to be redrawn.

- To manage significant patient discomfort or extensive target areas, the steroid can be mixed with bupivacaine or lidocaine [11]. Ensure the total bupivacaine dose does not exceed 2.5 mg/kg (25 mL of 0.5% bupivacaine or 70 mL of 0.25% bupivacaine for a 70 kg adult). If using lidocaine, the total dose should not exceed 4.5 mg/kg (31.5 mL of 1% lidocaine for a 70 kg adult).
- For patients with persistent or recurrent symptoms, the steroid dose is adjusted based on their prior response and current imaging findings. The current practice uses a maximum dose of 200 mg triam-

- **Imaging Annotation:** Since many patients with refractory IGM often require multiple treatments, annotating the total dose of steroid injected on the last ultrasound imaging is helpful.
- **Radiology Report:** As part of each report, include the date and dose of prior injections to provide quick assessment of dosing frequency. Some electronic medical record software offer an editable drawing tool for quick evaluation.

Post-Care

To reduce the risk of skin breakdown from adhesives, use a thin steri strip on the skin incision and instruct the patient to remove the following day. The steri strip can be removed after seven days or left to fall off on its own. Over-the-counter acetaminophen and ibuprofen usually provide enough pain relief during this time.

- Inform the patient that the steroid may take a few days to take effect. During this time, the local anesthetic will wear off, leading to possible breakthrough pain or persistence of the palpable concerns. This is expected and should improve once the steroid becomes effective.

Clinical/Imaging Follow-up

Clinical follow-up is important to assess the patient's response to treatment. Repeat ultrasound, as needed based on clinical evaluation, may be performed with the earliest imaging follow-up typically two weeks or more after steroid injection, depending on the severity of IGM. Further aspiration or steroid injection can be considered based on the clinical and imaging findings. Repeat steroid injection is a multidisciplinary decision that includes discussion with the patient.

- a) **Dosing Frequency:** Treating imaging findings corresponding to the patient's symptomatic area is reasonable, but it is less clear whether to treat similar non-symptomatic imaging findings. Given the unknown pathophysiology of disease progression, these areas are included in the treatment plan. If symptoms persist two weeks after the initial steroid injection, a second intervention is considered. In addition to the standard risks of systemic oral prednisone, the discussion of risks includes atrophy, bruising, and sterile abscess formation [14–16] at the treatment sites.
- b) **Cumulative Maximum Dose:** The maximum cumulative dose of injected triamcinolone remains unknown and is determined on a case-by-case basis through multidisciplinary discussion. Informing the patient that the treatment regimen may entail several months helps them understand the goal of minimizing side effects by extending the time between injections. For example, four intraleisional steroid injections (160 mg, 200 mg, 160 mg, and 160 mg) were performed over five months in a patient with painful and palpable multicentric, D1–2–3 disease with skin fistulas. Two months after the last injection, the patient presented with recurring pain and palpable masses. Ultrasound confirmed multicentric, D1–2–3 masses in that location. After diagnostic aspiration, 200 mg triamcinolone was injected. In some cases, aspiration-only without steroid injection may also be considered.
- c) **Topical steroids:** Topical corticosteroids can be used as an adjunct to control cutaneous manifestations and prevent skin breakdown [16,17,18]. Combining topical and intraleisional steroids may help extend the time between intraleisional steroid injections and reduce the low risk of side effects, including atrophy, bruising, and sterile abscess formation [14]. Topical steroids triamcinolone 0.1% twice daily, five days on, two days off, for two weeks can be tried. Apply a thin layer of topical triamcinolone under plastic wrap or cling film.

6. Conclusion

Treatment of IGM can be approached with targeted aspirations, intraleisional corticosteroid injections, and clinical and sonographic breast diagrams for longitudinal follow-up. The evidence supporting the use of intraleisional corticosteroid injections for these cases continues to grow.

Declaration of generative AI and AI-assisted technologies in the writing process: There are variations in ultrasound-guided techniques with expected success depending on experience and personal preferences. Buffered lidocaine [11] has been implemented in our practice. Targeting the deepest aspect of lesions is prioritized, as these can present imaging findings. This technical note describes triamcinolone acetate injections for IGM (Fig. 6), which can be considered with or without systemic steroids.

Imaging surveillance of IGM is not standardized. While imaging findings at baseline and follow-up have not correlated with final IGM outcomes [26], longitudinal clinical and imaging follow-up, documented on breast diagrams, aids in multidisciplinary treatment planning as well as patient reassurance.

The main limitation of this technical note is the need for prospective validation partly due to the rarity of the disease. However, our proposed approach aligns with previously published work [13,21]. National and international collaboration is needed for greater prospective, randomized data to further support interventions for IGM.

Data sharing statement
 All data generated or analyzed during the study are included in the published paper.

CRediT authorship contribution statement

Dan Moldoveanu: Data curation, Investigation, Methodology, Writing - original draft, Writing - review and editing. Christine Lee: Conceptualization, Data curation, Project administration, Supervision, Investigation, Methodology, Writing - original draft, Visualization, Writing - review and editing. Gina Hesley: Data curation, Investigation, Methodology, Writing - original draft, Visualization, Writing - review and editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

The authors thank Nathan J. Brinkman, PharmD, RPh for his expertise and efforts helping us develop this practice.

TREATMENT

✓ No Treatment

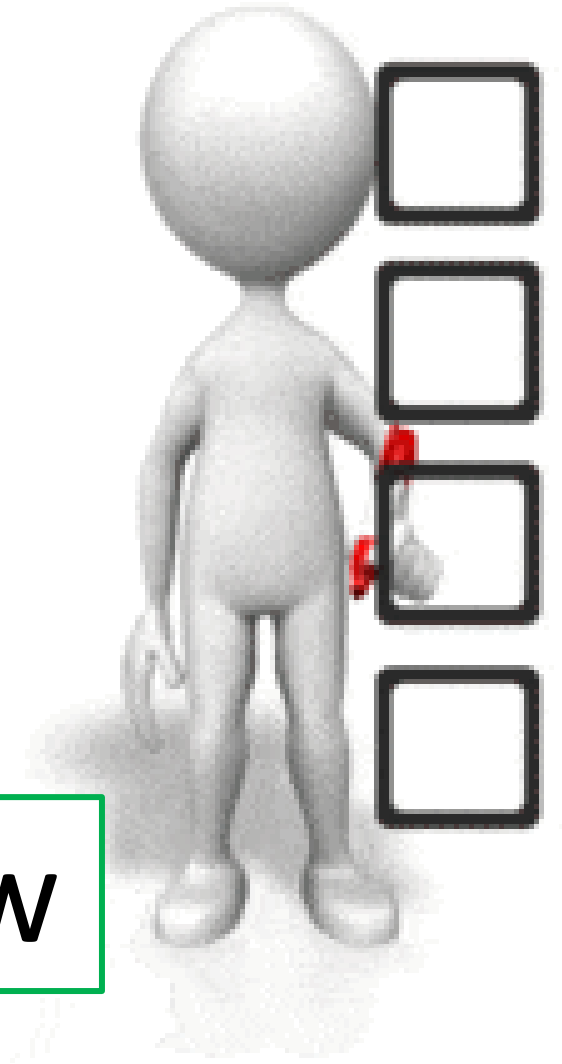
✓ NSAIDs

✓ Antibiotics

✓ Steroids

✓ Methotrexate

Mostly 5-25 mg/w



Kundaktepe 2021: **64 patients**, including 56 resistant cases

MTX monotherapy 15 mg/w, 24 weeks,

In relapsed cases, 20 mg/w for 1 year

Supplement: Folic acid 10 mg/w

→ Complete recovery: 81% → Side effects: 5%

→ MTX monotherapy suitable for treatment-resistant IGM

Sari 2022: **241 patients with available follow-up**

Medical treatments: Steroids alone, MTX alone (10-20mg/w), Steroids + MTX, or treatments containing Azathioprine

→ Highest complete remission: Steroids (100%) then MTX (97%)

Shortest time to complete remission: MTX (mean: 6 months)

Highest recurrence: Steroids alone (17%)

→ MTX: High complete remission, low length of treatment, low recurrence

TREATMENT

✓ No Treatment

✓ NSAIDs

✓ Antibiotics

✓ Steroids

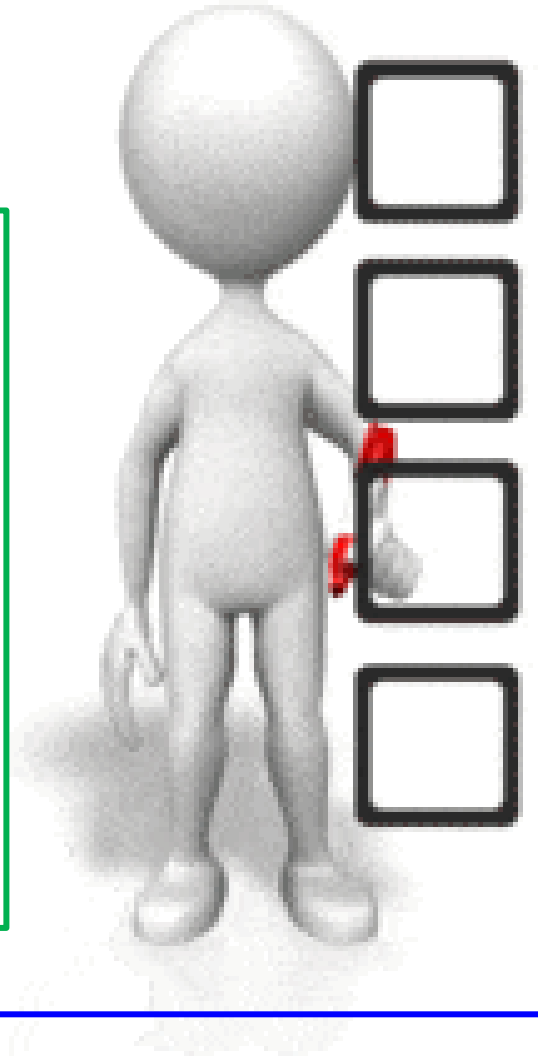
✓ Methotrexate

Mostly

- Azathioprine (Azaram)

- ...

✓ Immunosuppressives



TREATMENT

✓ No Treatment

Konan 2012: 14 patients, Prednisolone + Azathioprine,

73% complete response ; 2 relapses

→ *The addition of azathioprine to steroids permits quick steroid tapering and increases treatment success*

✓ Steroids

• ...

✓ Methotrexate

✓ Immunosuppressives

TREATMENT

✓ No Treatment

✓ NSAIDs

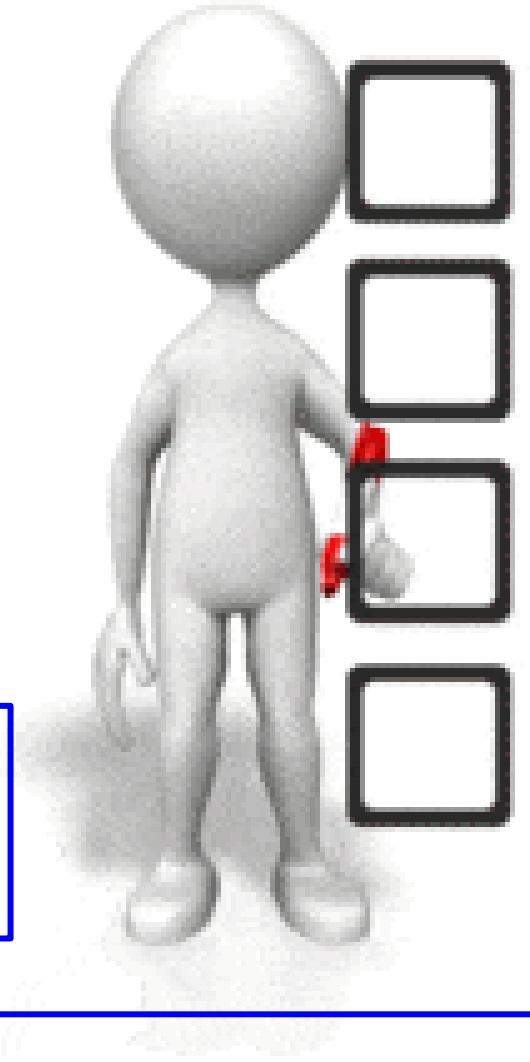
✓ Antibiotics

✓ Steroids

✓ Methotrexate

✓ Immunosuppressives

✓ Colchicine



TREATMENT

✓ No Treatment

✓ NS VANOVCANOVA 2019: 39 patients

Colchicine, vitamin E and ribwort plantain tincture

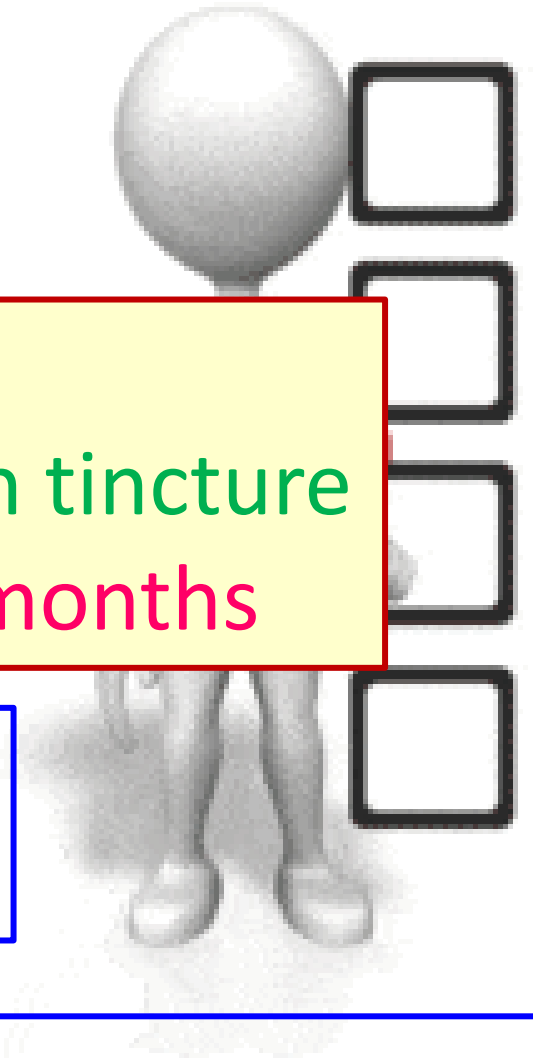
✓ Ar 100% complete response between 6-19 months

✓ Steroids

✓ Colchicine

✓ Methotrexate

✓ Immunosuppressives



TREATMENT

- Drainage
- Excision
- +Oncoplasty
- Mastectomy
- +Reconstruction

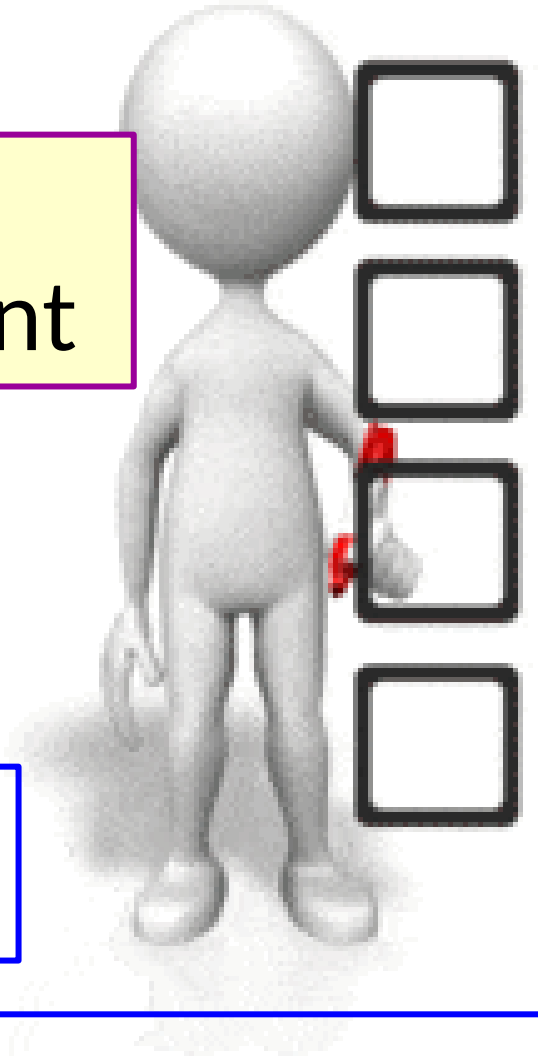
Kaviani 2018: The recurrence rate following surgery was significant

✓ Surgery ←

✓ Colchicine

✓ Methotrexate

✓ Immunosuppressives



Zhou 2020: **Meta-analysis of surgery vs. medication** (steroids, MTX, ABs, observation)

10 studies, 1101 patients

→ **No significant difference in recurrence rate**

2

Lei 2017 **systematic review 15 studies**

Complete remission:

1

Surgery 91%

Oral steroids 72%

Oral steroids + surgery 95%

Recurrence rates:

Surgery 7%

Oral steroids 21%

Oral steroids + surgery 4%

Fattahi 2023: **Systematic review**

71 studies, 4735 patients

Recurrence rates:

3

Surgery 23%

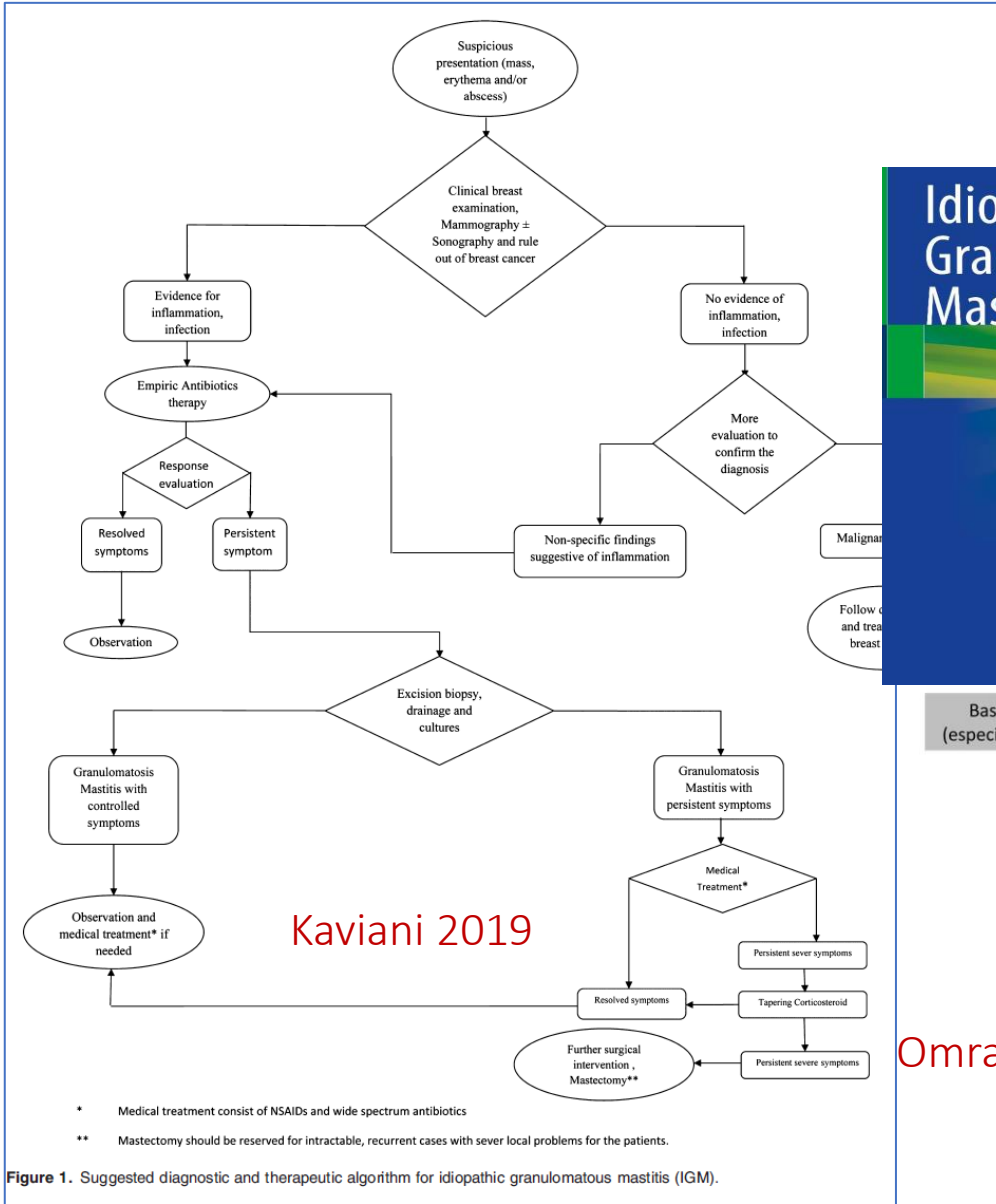
Immunosuppressives 15%

Combined treatment 15%

Antibiotic treatment 7%,

Observation 9%

Tx protocols



Kaviani 2019

Figure 1. Suggested diagnostic and therapeutic algorithm for idiopathic granulomatous mastitis (IGM).

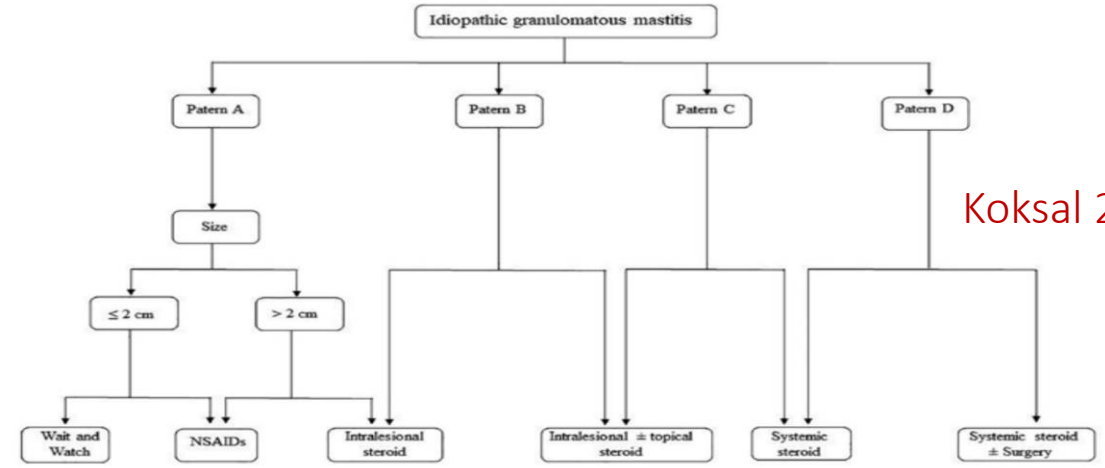
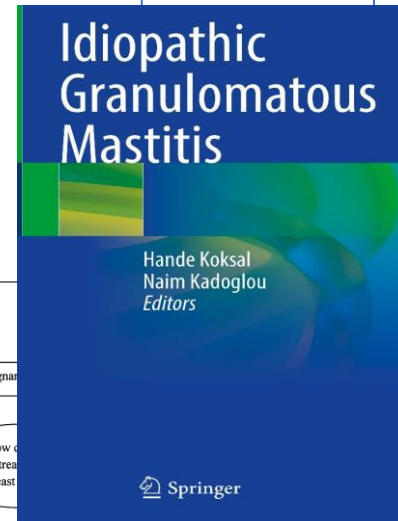
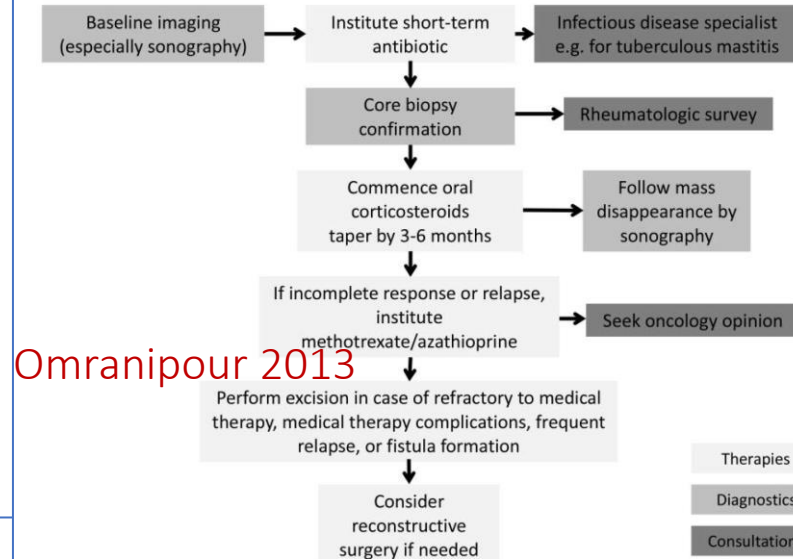
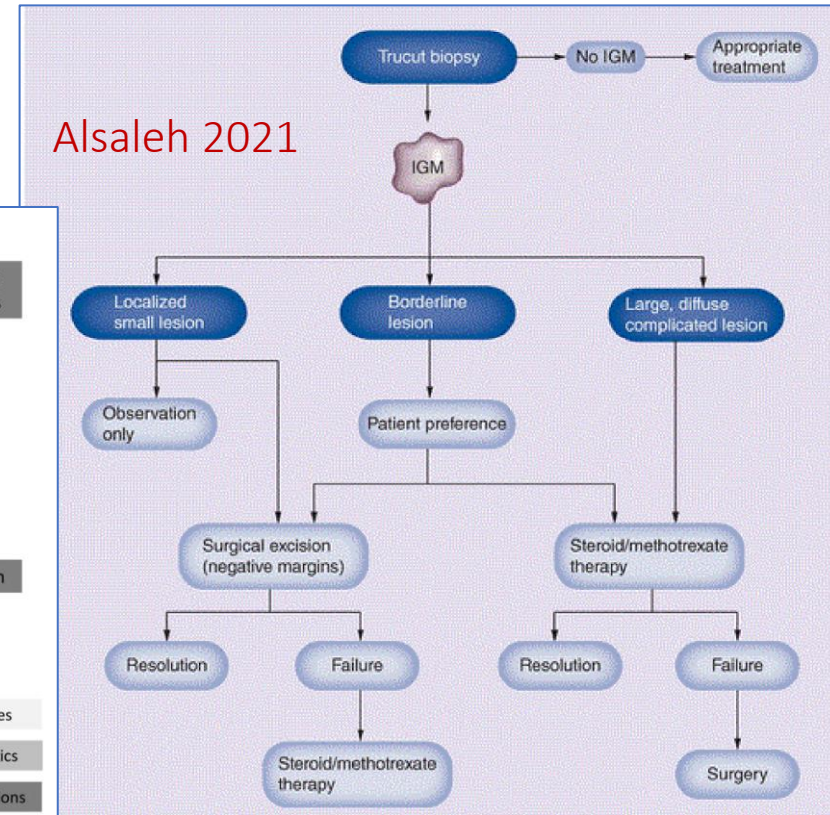


Fig. 1 An overview of treatment approaches in IGM

Koksal 2023



Omranipour 2013



Alsaleh 2021

EPiDEMiologY



Turkey

Metanat 2022

Turkey, USA, and China:
the countries with the
most publications

Iran

China

Hispanics



ETiology

Autoimmunity

Ethnicity

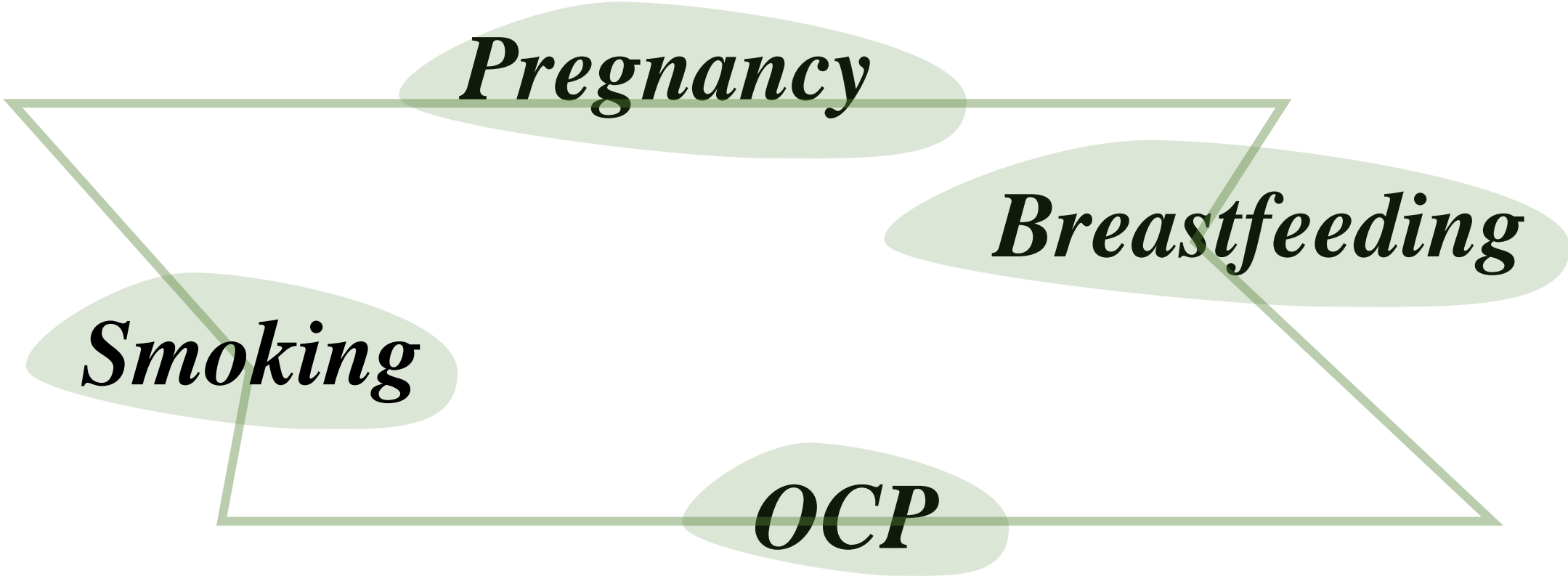
Hormonal

Trauma

4 *Corynebacterium*
species detected

Microbial

RISK FACTORS



DIAGNOSIS

Biopsy

R/O AFB

R/O ...

Differential diagnoses:
TB, histoplasmosis,
sarcoidosis, FB reactions

R/O foreign body







R/O Fungi

16- 25%

Rate

Recurrence

Associated factors

-  skin lesions
-  Disease duration > 12 months
-  Pregnancy
-  Breastfeeding
-  Breast Infection
-  Smoking

DEFINITION

Idiopathic granulomatous mastitis is a rare, benign, chronic, inflammatory lesion of the breast

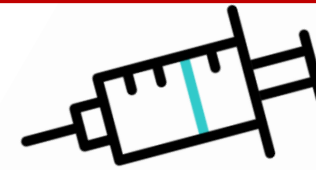
Defined first in 1972 by Kessler and Woollock

Described in detail in 1977 by Cohen

**2022 Consensus: recommends
Granulomatous Lobular Mastitis (GLM)
as a widely accepted definition**



IGM Clinic



Launched since 6 months ago in the public sector

In Yalda Clinic, Tehran University of Medical Sciences, Tehran, Iran

Presently accepting patients twice weekly

Using forms designed by experts for data collection

Inviting all physicians in Iran and globally to use similar forms

To use collective data for future research collaboration

Will be entering data in Iran IGM Registry in very near future



**Multiple Multicentric Research Projects
are being presently ran throughout the country**



IGM- Clinical Trial

IGM- Diet

IGM- Risk Factors

IGM- Breastfeeding

IGM- Standard Clinical Data Form

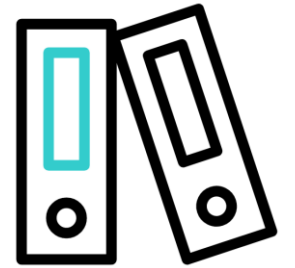
IGM- Classification

IGM- Registry

...



IGM REGISTRY



- Is now active in the USA
- Is being planned and launched in the UK and in Germany
- Recently launched in Iran: in the pilot phase of data entering
 - ✓ Every public or private medical center worldwide that actively sees IGM patients is invited to collaborate in the registry
 - ✓ For collaboration, please email: sadafalipour@yahoo.com

Goodbye

