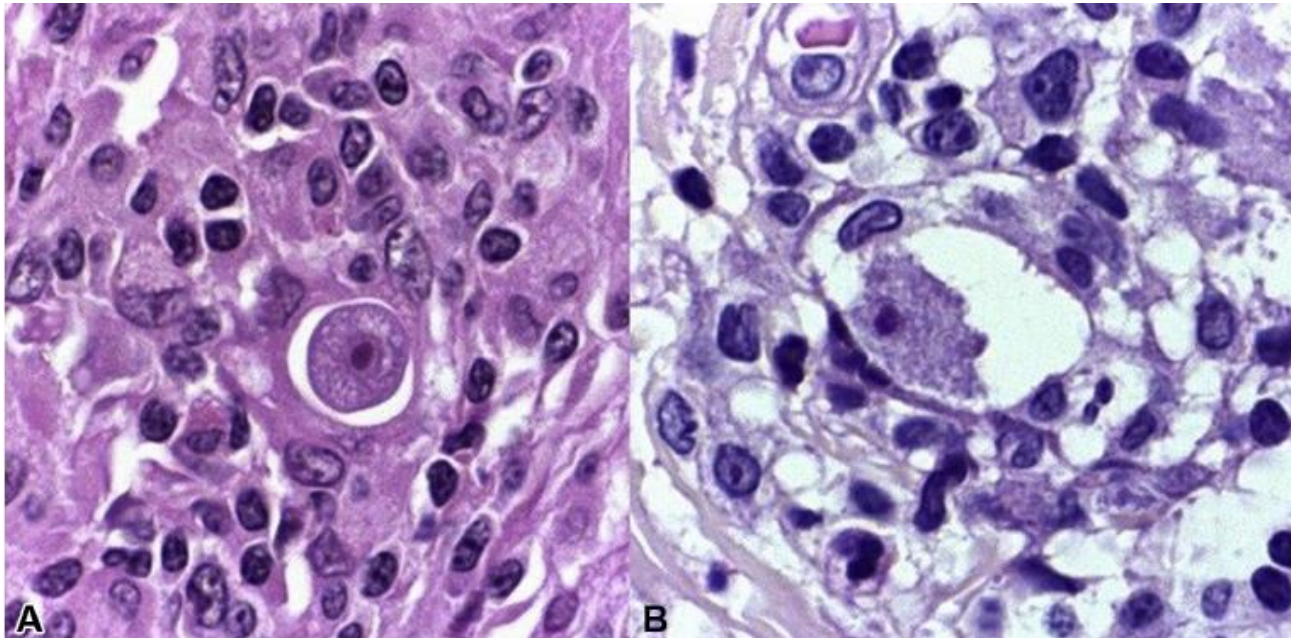


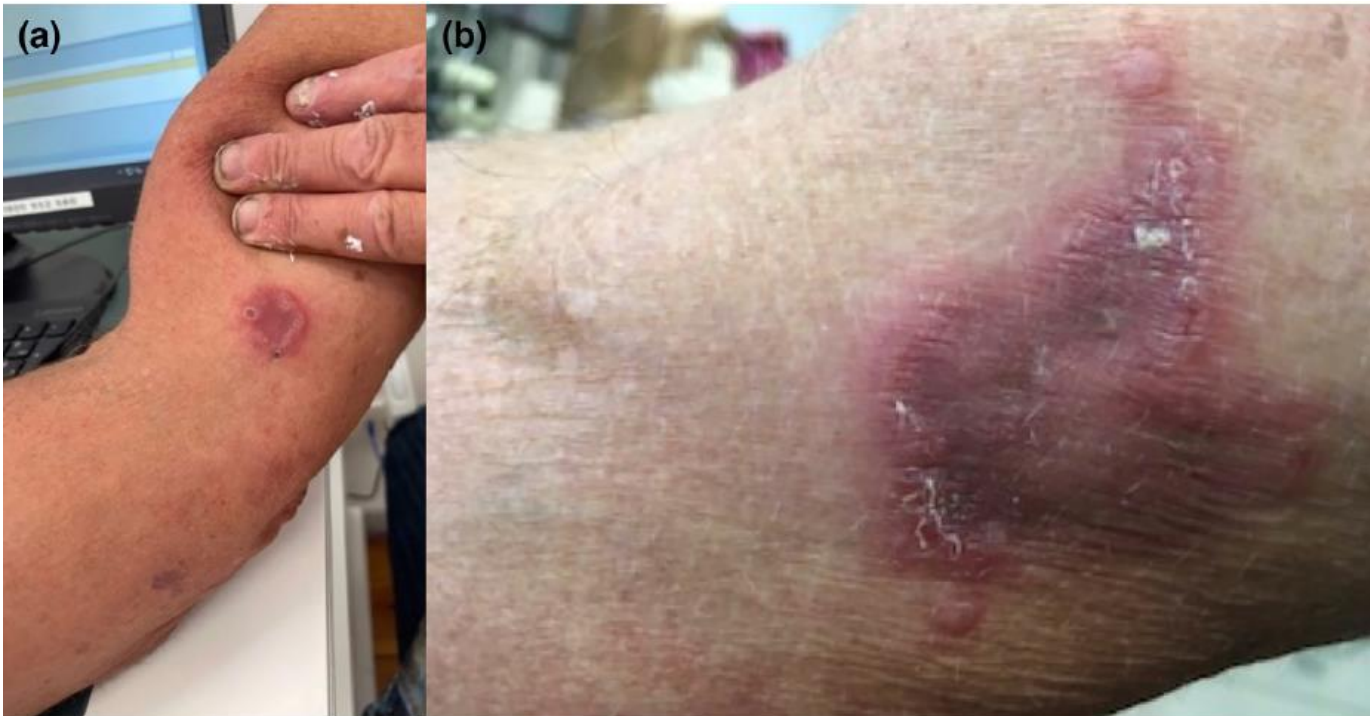


## Balamuthia mandrillaris

Case report: Delayed diagnosis with fatal outcome



66 year-old man, referred to dermatologist, lesion on his right upper inner arm, December 2021



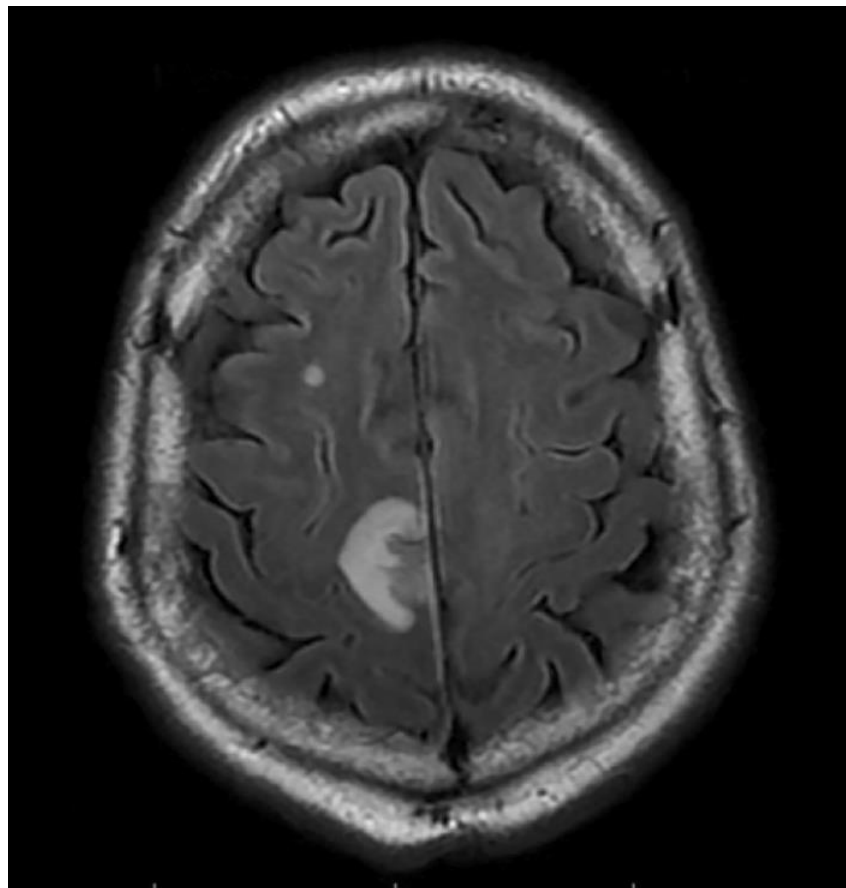
- Other history
  - Systemically well, not immunocompromised
  - Keen gardener and fisherman

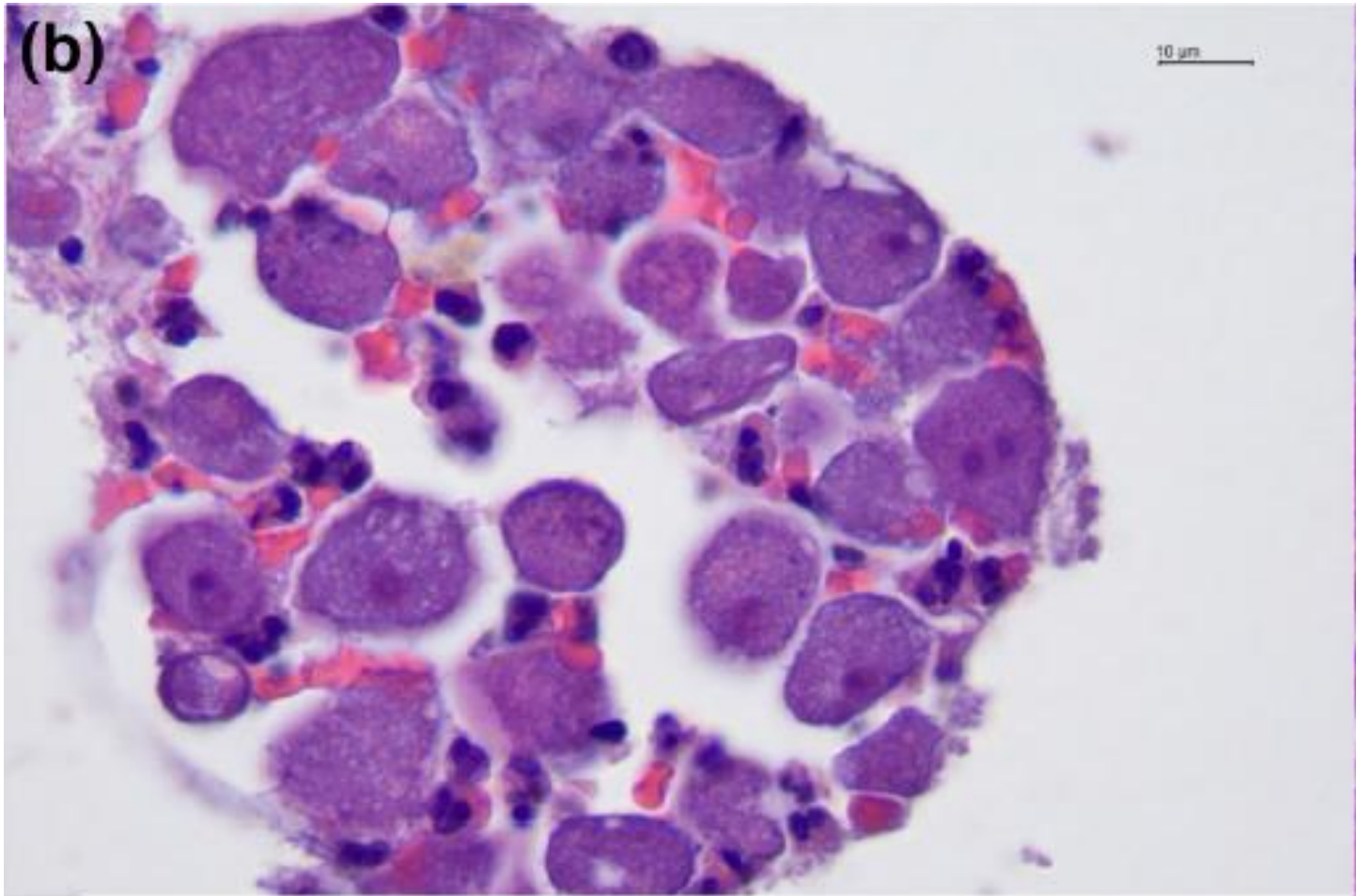
- Initial work-up and treatment
  - Skin punch biopsy: non-necrotising granulomatous inflammation
  - Special stains negative for micro-organisms (PAS, Grocott, gram, ZN, WF, Spirochaete immunostain)
  - Culture, mycobacterial / treponemal PCR negative
  - Treated: itraconazole and minocycline

- Progression
  - Lesion continued to grow
  - 3 further biopsies non-diagnostic

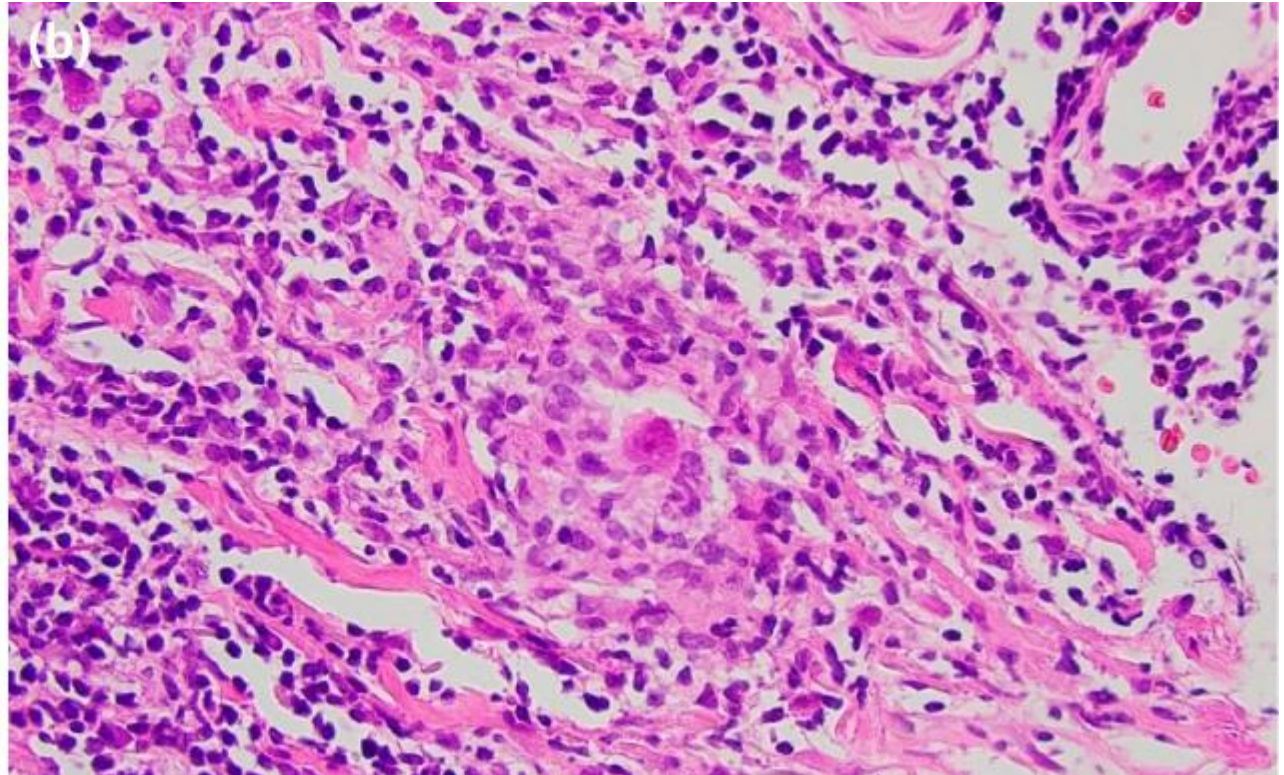
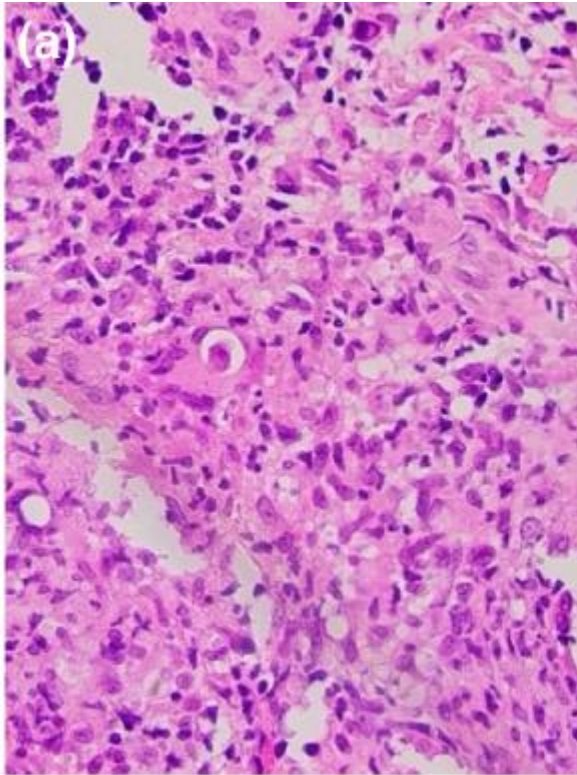
June 2022

- Presented with fall, confusion and left-sided clumsiness 2/52
- CT / MRI: Right posterior frontal cerebral mass, 14x9mm. Suspected GBM.





Amoebae with morphologic appearance of *Balamuthia mandrillaris*



Retrospective review of skin biopsy: Rare amoebae

## PCR

- *Balamuthia mandrillaris* DNA detected in brain and skin biopsies

## Treatment

- Albendazole, fluconazole, miltefusine
- Patient passed away 12 days after diagnosis

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BRIEF REPORT

Australasian Journal of  
**Dermatology**



## Fatal granulomatous amebic encephalitis initially presenting with a cutaneous lesion

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# Balamuthia mandrillaris

- Free living amoeba
- First identified in 1986
- May affect immunocompetent or immunocompromised patients
- Found in soil and water

## Environmental Isolation of *Balamuthia mandrillaris* Associated with a Case of Amebic Encephalitis

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Candice K. Kohlmeier,<sup>1</sup> Carol Glaser,<sup>1</sup> Duc Vugia,<sup>3</sup> Anna Bakardjiev,<sup>4</sup> Parvin Azimi,<sup>4</sup>  
Mary Maddux-Gonzalez,<sup>5</sup> A. Julio Martinez,<sup>6†</sup> and Govinda S. Visvesvara<sup>7</sup>



# Clinical manifestations

- Subacute to chronic meningoencephalitis
- With or without skin lesions



**Fig 1.** Cutaneous balamuthiasis. **A**, The classical clinical appearance is a painless plaque on the central face, especially on the nose. **B**, The knee is the second most common location.

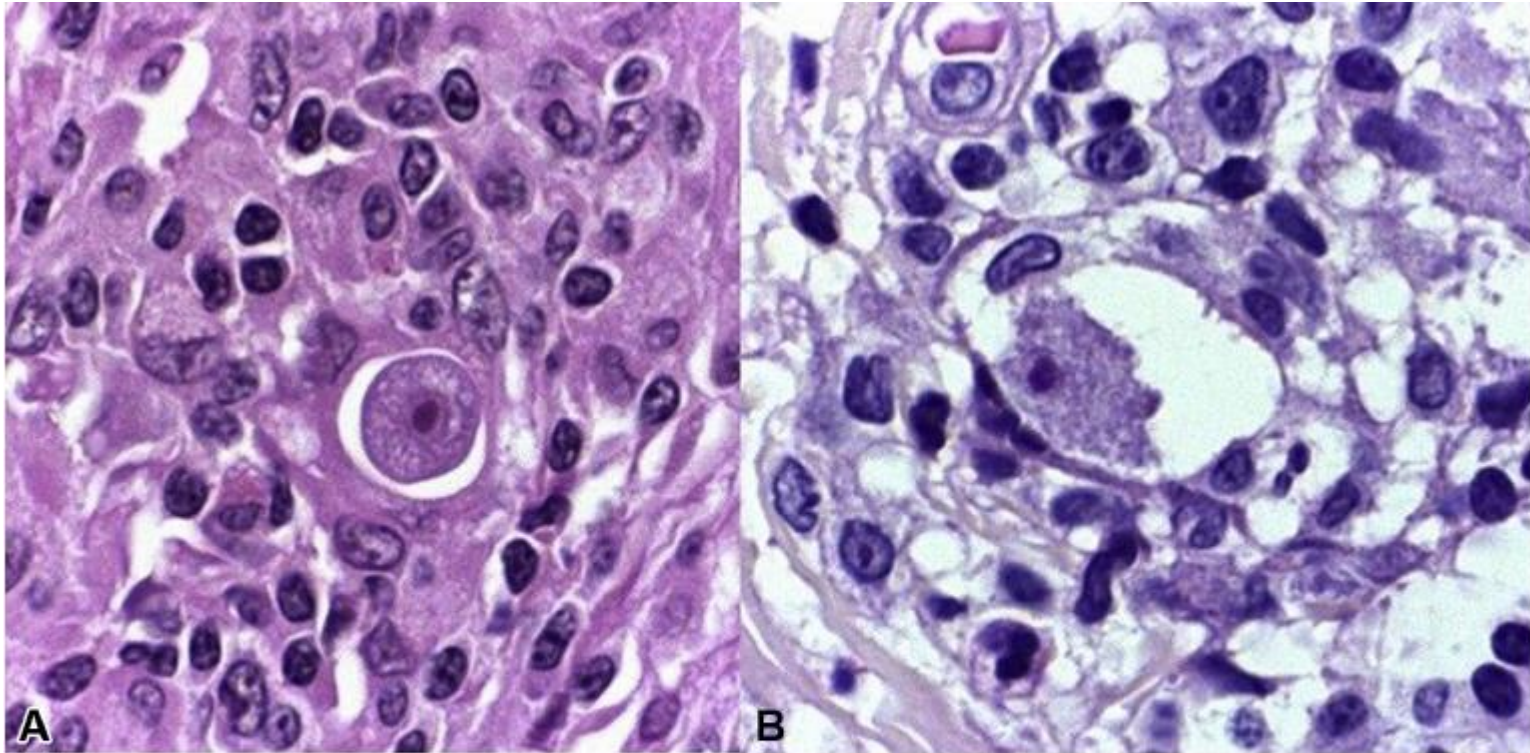
Reference: Alvarez et al. Cutaneous Balamuthiasis: A clinico-pathological study.

## Diagnosis

Histology (H+E)

Indirect immunofluorescence

PCR (2 labs in Australia)

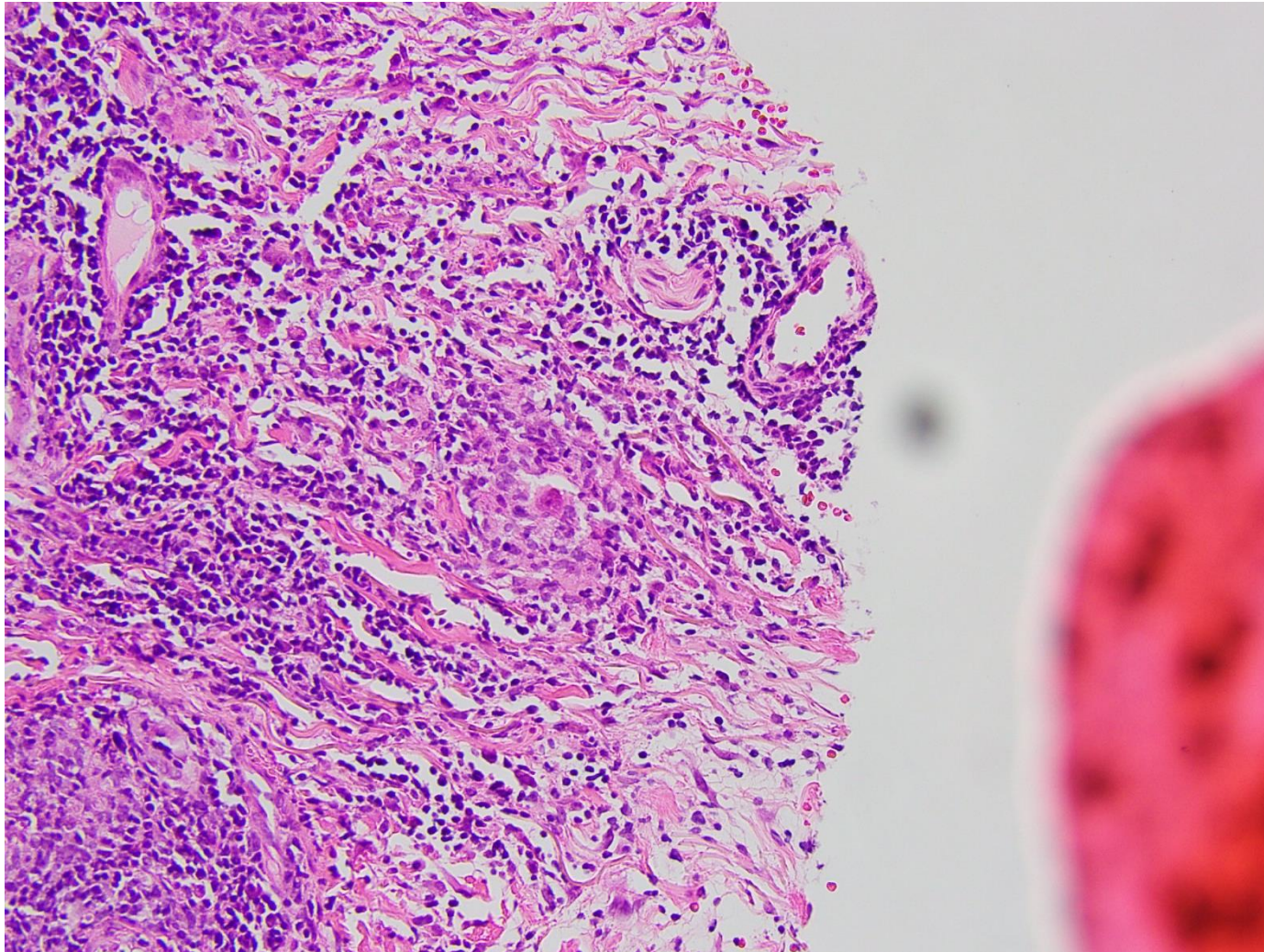


**Fig 4.** Cutaneous balamuthiasis. **A**, *Balamuthia mandrillaris* trophozoite displays the typical oval shape; small, round nucleus with a large nucleolus; and bubbly cytoplasm. An artifactual retraction around the organism gives the appearance of a lacunar space. **B**, The trophozoites may adopt a more irregular shape and mimic the histiocytes (**A** and **B**, Hematoxylin-eosin stain; original magnifications: **A**,  $\times 1000$ ; **B**,  $\times 1000$ .)

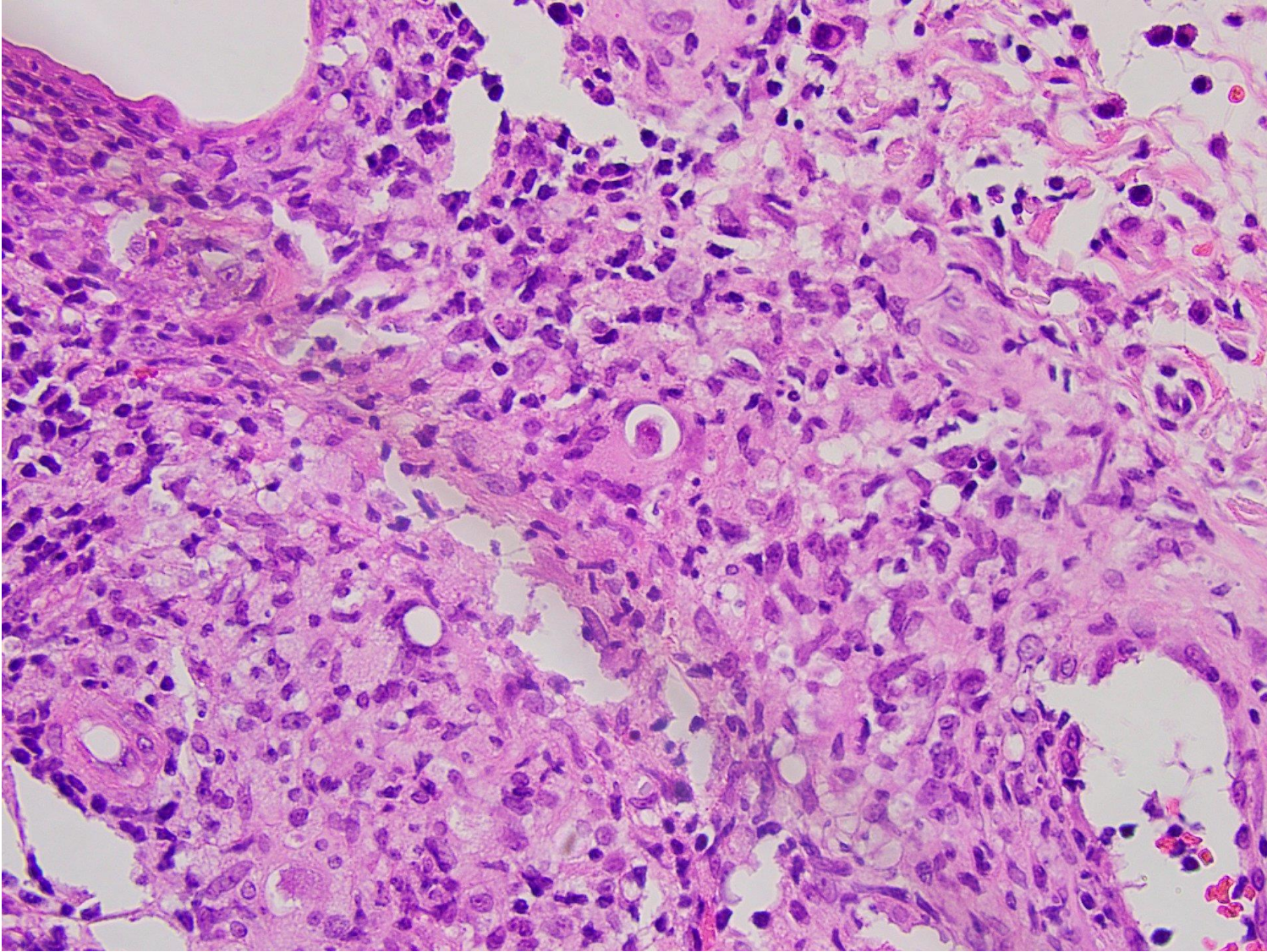
TABLE 1 Summary of known Australian human cases of *B. mandrillaris* infection.

Age (years), sex	Location, year	Risk factors	Presentation	Diagnosis	Outcome
2F	Perth, Western Australia, 1974	None	Encephalitis	Post-mortem brain tissue: trophozoites seen	Died
5M	Tasmania	None	Midline facial lesion extending into maxillary sinus & orbit, encephalitis	Brain biopsy: trophozoites and cysts seen, IIF positive	Died
8 months M	Perth, Western Australia	None	Meningoencephalitis, mycotic middle cerebral artery aneurysm	Post-mortem brain tissue: trophozoites seen, IIF positive	Died
80F	Rural Victoria	No comorbidities, trauma to hand while gardening	Skin lesions hand and arm, encephalitis	Skin and brain biopsies: trophozoites seen, PCR positive	Survived, full neurological recovery <sup>a</sup>
11F	Western Queensland	Unknown	Encephalitis	Post-mortem brain tissue: trophozoites seen, IIF positive	Died
4F	Rural Southeast Queensland 2011	None, property flooded 8 months prior	Encephalitis	Brain biopsy: trophozoites seen, PCR positive, IIF positive	Survived, full neurological recovery <sup>b</sup>
59M	Gold Coast, Queensland, 2012	Rural fresh water, cow faeces exposure, sewage exposure	Meningoencephalitis	CSF: PCR positive	Died
76M	Perth, Western Australia 2016	Unknown	Meningoencephalitis	Post-mortem brain tissue: trophozoites and cysts seen, PCR positive	Died
63F	Central Coast Queensland 2016	Unknown	Encephalitis	CSF and brain tissue: PCR positive	Died
2F	Katherine region, Northern Territory 2018	Unknown	Encephalitis	CSF: PCR positive	Died

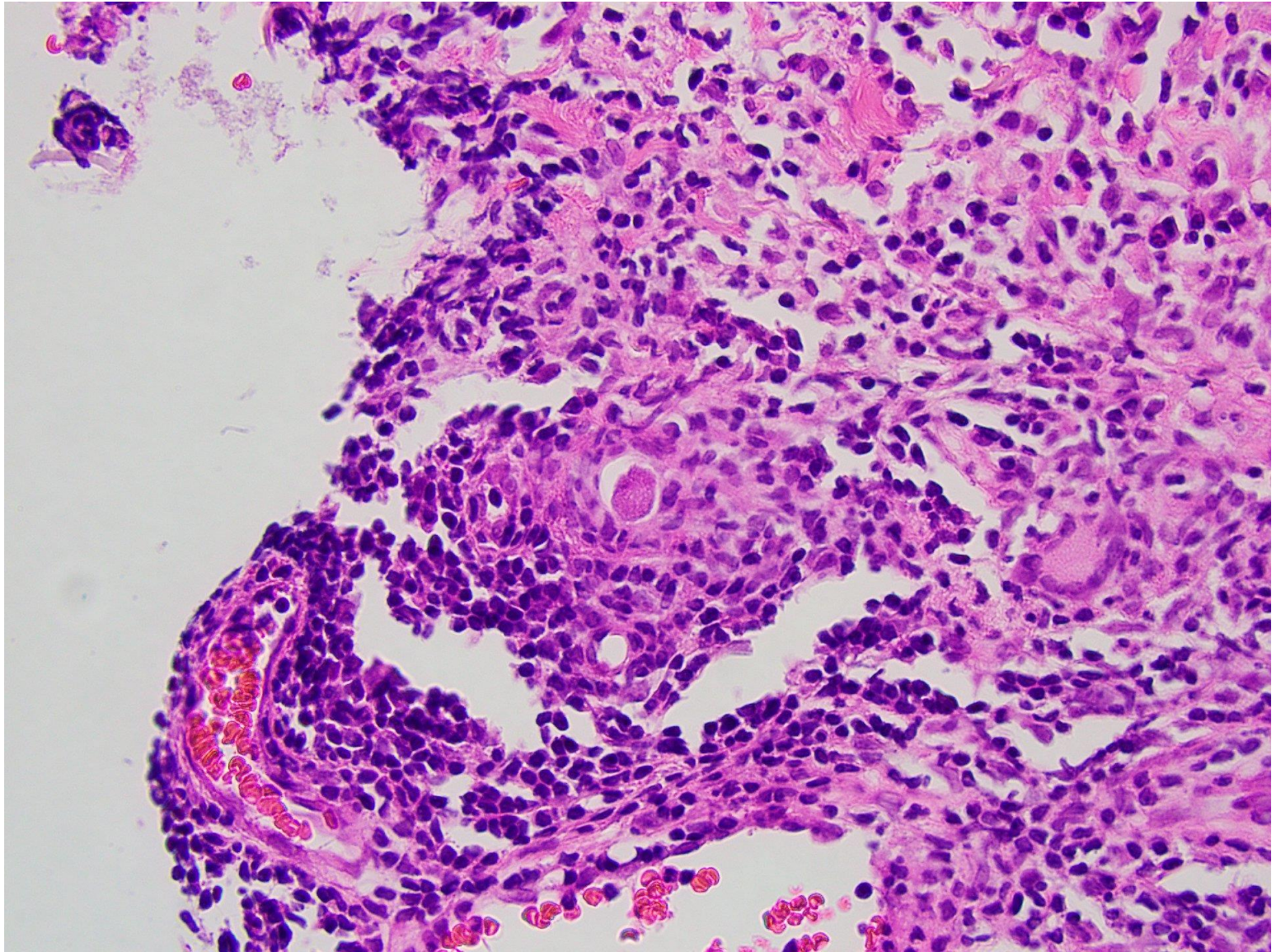
Histology: 24 slices of the punch, across 6 slides, probably 4 amoebae



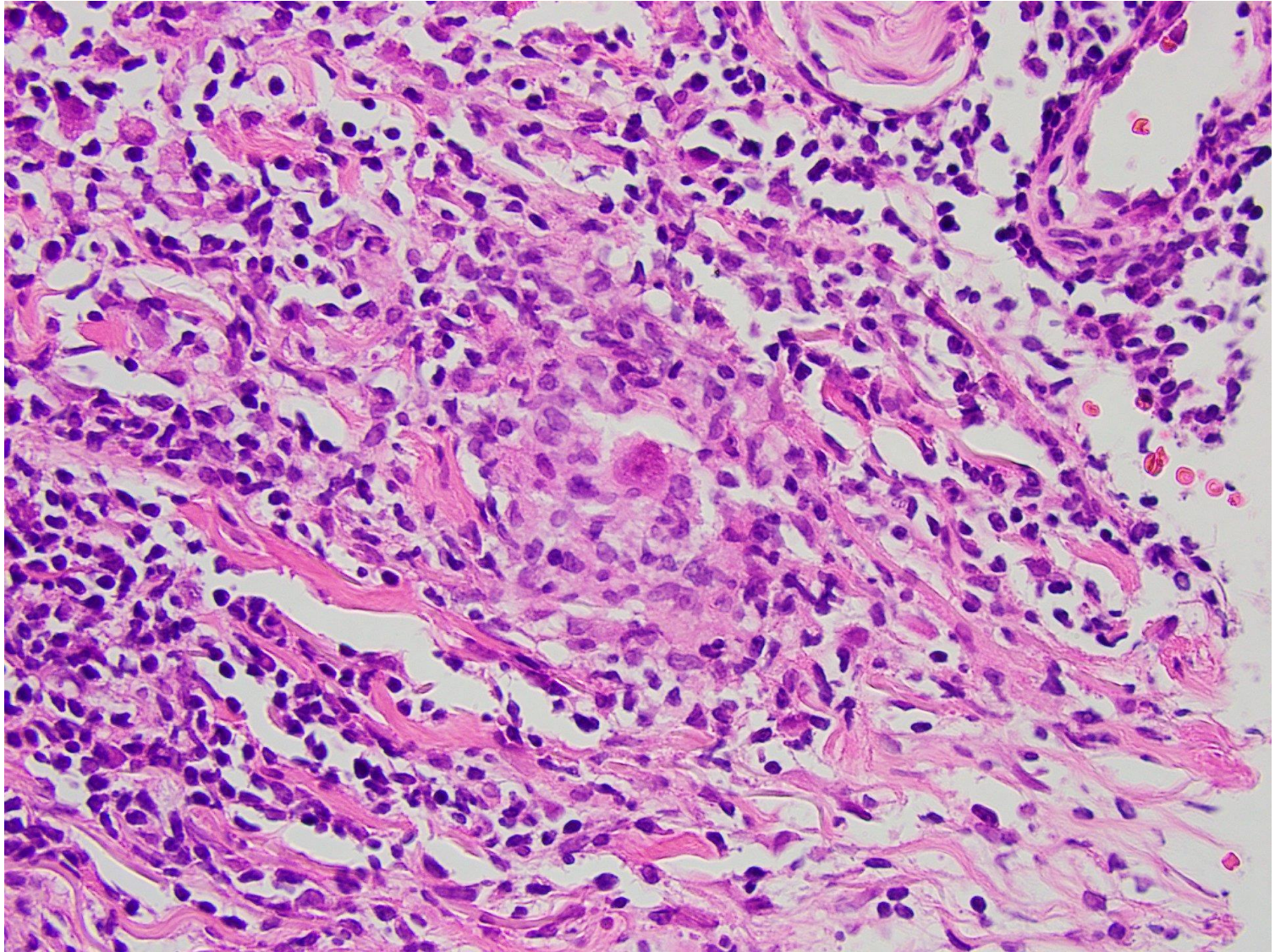
20x



40x



40x



# Personal reflections

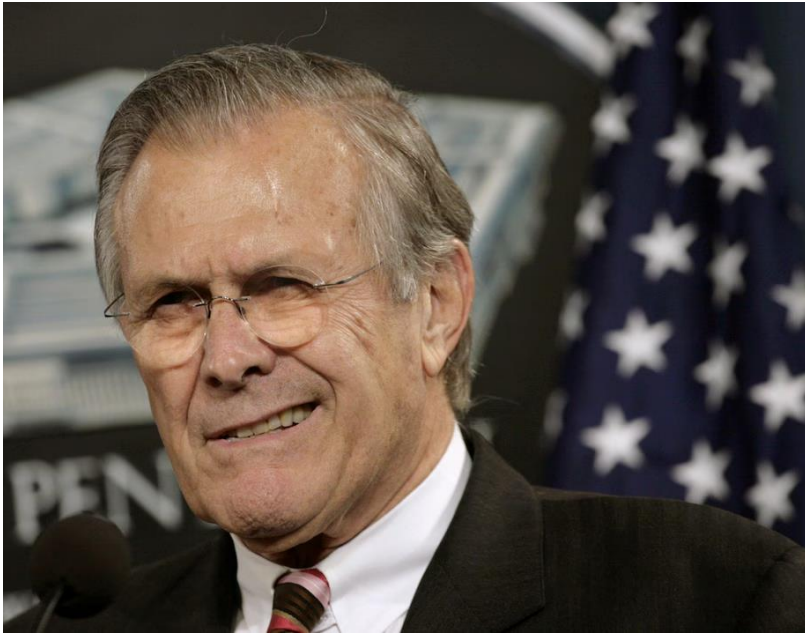
Value of the H+E

Incredible work colleagues

AI

More paranoia?





There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we know we don't know. But there are also unknown unknowns. There are things we don't know we don't know.

Donald Rumsfeld

***Thank you***