



# **TAENIASIS/CYSTICERCOSIS IN BALI ISLAND, INDONESIA**

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# *Outline*

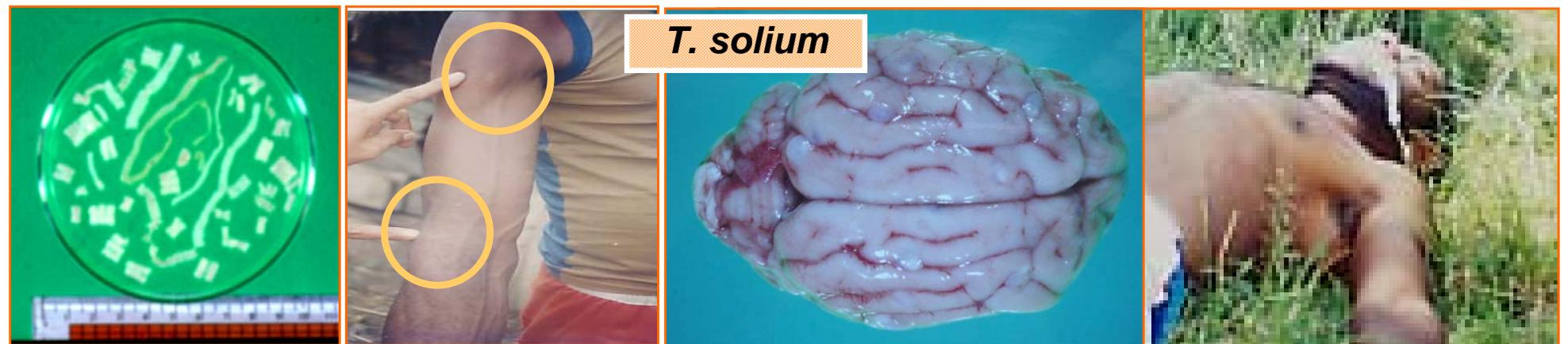
- **Introduction**
- ***Taenia saginata* Taeniasis  
in Bali island**
- ***Taenia solium* cysticercosis  
in Bali island**

# Introduction

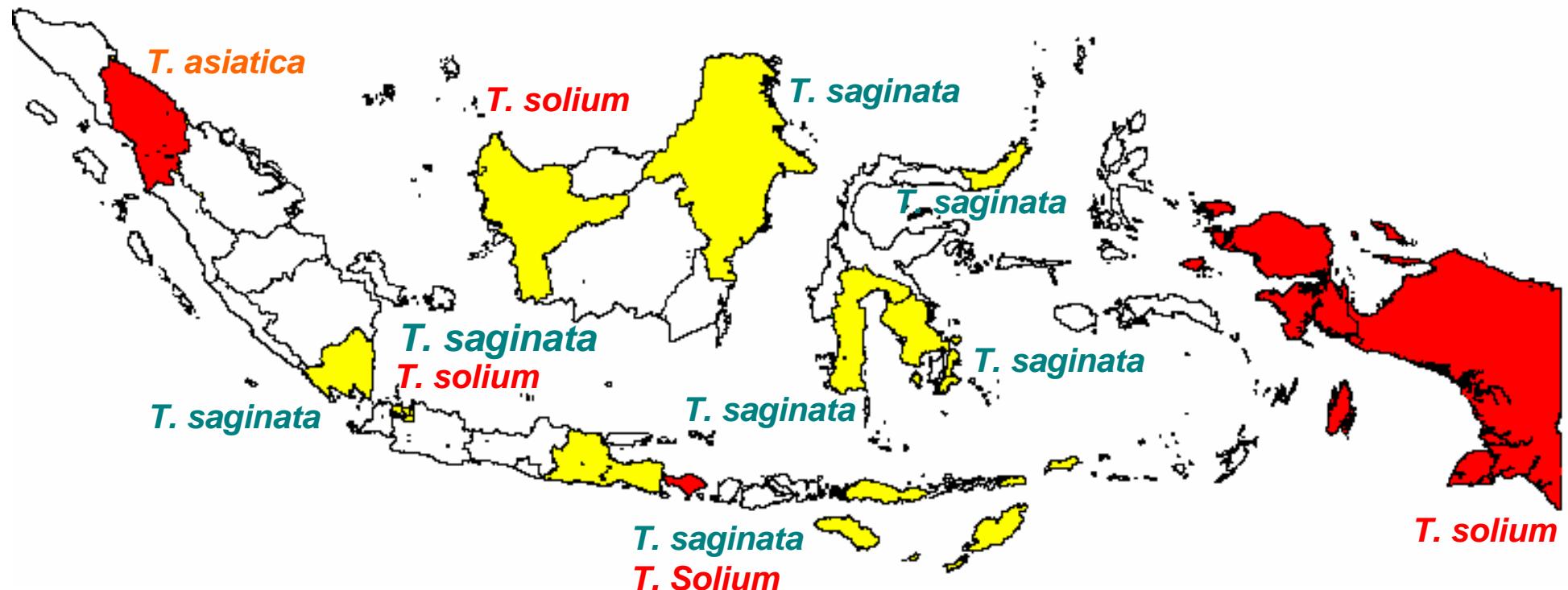
*Taenia saginata* or *Taenia asiatica*, cause **taeniasis**



*Taenia solium*, causes two distinct clinical presentations: **taeniasis & cysticercosis**



# Map. Endemic and sporadic provinces of taeniasis/cysticercosis in Indonesia



█ Endemic Provinces  
█ Sporadic Provinces

# **TAENIASIS/CYSTICERCOSIS IN BALI ISLAND**

# Geographic maps of Indonesia (upper) & Bali (lower)



# **T. SAGINATA TAENIASIS IN BALI ISLAND**

# Tab. Number of case of *T. saginata* taeniasis by districts of Bali island, 2002-2009

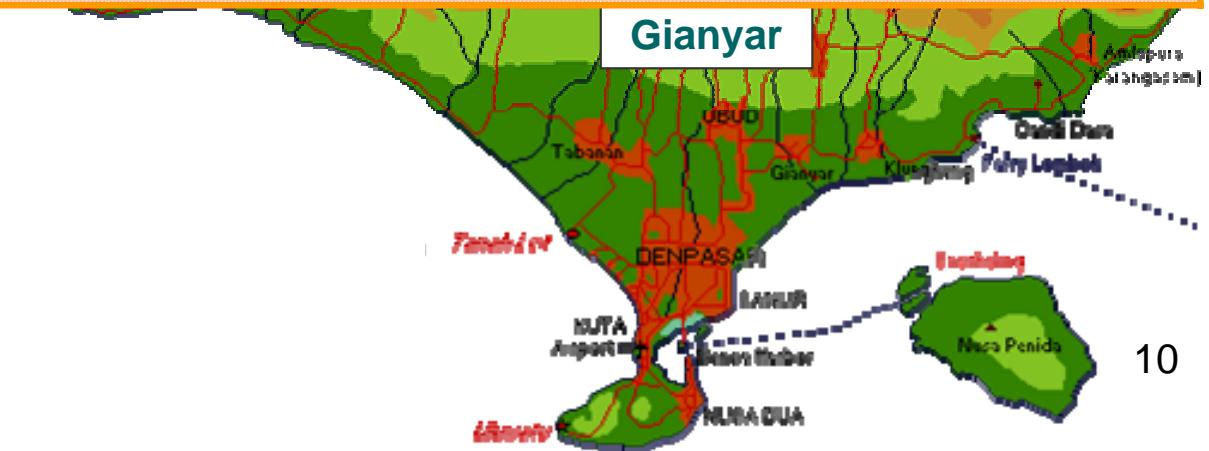
District (year)	No. of Case	Reference
Gianyar (2002-9)	67	Wandra <i>et al.</i> (2007); Wandra <i>et al.</i> , unplied
Denpasar (2004-5)	11	Wandra <i>et al.</i> (2007)
Badung (2004)	1	Wandra <i>et al.</i> (2007)
Karang Asem (2006)	1	Wandra <i>et al.</i> (2007)
Bangli (2007)	0	Wandra <i>et al.</i> , unplied data
Tabanan (2008)	0	Wandra <i>et al.</i> , unplied data
Jembrana (2008)	0	Wandra <i>et al.</i> , unplied data
Klungkung (2009)	0	Wandra <i>et al.</i> , unplied data
Buleleng (2009)	0	Wandra <i>et al.</i> , unplied data
<b>Total (2002-2009)</b>	<b>80</b>	



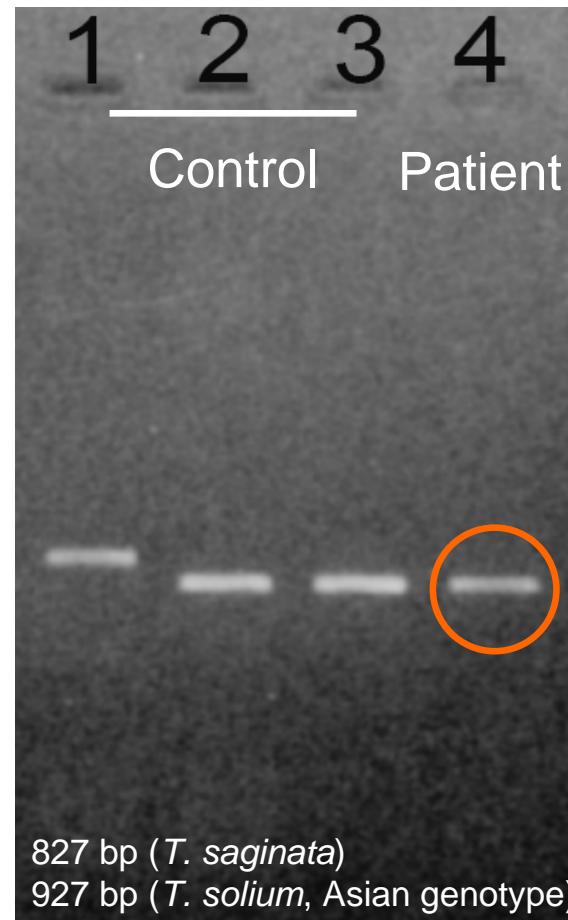
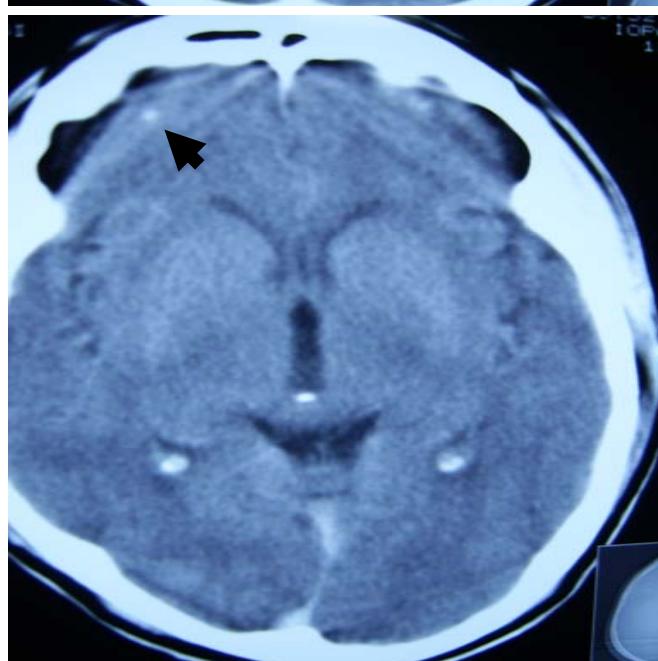
**Beef “Lawar”**

# Tab. Number of case of *T. saginata* taeniasis in Gianyar district, Bali island, 2002-2009

District (year)	No. of Case	Reference
Gianyar (2002)	32	Wandra <i>et al.</i> (2007); Wandra <i>et al.</i> , unplied
Gianyar (2004)	14	Wandra <i>et al.</i> (2007)
Gianyar (2005)	5	Wandra <i>et al.</i> (2007)
Gianyar (2006)	2	Wandra <i>et al.</i> (2007)
Gianyar (2007)	3	Wandra <i>et al.</i> , unplied data
Gianyar (2008)	4	Wandra <i>et al.</i> , unplied data
Gianyar (2009)	7	Wandra <i>et al.</i> , unplied data



# Dual Infection (*T. saginata* taeniasis and neurocysticercosis) in Bali island, 2007



DNA analysis (mPCR) of proglottid

1. *T. solium*
2. *T. saginata* (Thailand)
3. *T. saginata* (Bali)
4. ***T. saginata* (patient)**

ELISA & Immunoblot: +

- OD value = 0.103  
(before treatment)
- OD value = 0.578  
(after treatment)

(cut off = 0.022)

A 47-year-old, Balinese man with *T. saginata* taeniasis and neurocysticercosis

# **T. SOLIUM/CYSTICERCOSIS IN BALI ISLAND**

# Summarized data of *T. solium* Taeniasis, Subcutaneous Cysticercosis (SCC) and and Neurocycticercosis (NCC) in Bali, 1960-97

Area/hospital	Diagnosed	No. of case
<sup>1</sup> Bali	<i>T. solium</i> taeniasis	2
<sup>2</sup> Denpasar		1
<sup>3</sup> Denpasar		1
<sup>4</sup> Denpasar (1991-1993)		2
<sup>5</sup> Bali	SCC	2
<sup>6</sup> Bali (found in Jakarta)		4
<sup>7</sup> Udayana University, Bali		6
<sup>8</sup> Wangaya Hospital, Dps	NCC	4
<sup>9</sup> Denpasar (1991-93)		2 + 1 with nodule
<sup>10</sup> Sanglah Hosp, Dps (1995-97)		25

<sup>1</sup>Simanjuntak *et al.* (1977), <sup>2</sup>Bakta *et al.* (1983), <sup>3</sup>Sutisna (1990), <sup>4</sup>Sutisna (1990),  
<sup>5</sup>Soebroto *et al.* (1960), <sup>6</sup>Hadjidjaya (1971), <sup>7</sup>Susanti (1975) quoted from Sutisna (1994),  
<sup>8</sup>Ngoerah (1975), <sup>9</sup>Sutisna (1994), <sup>10</sup>Sudewi & Nuartha, unpublished quoted from  
Sutisna *et al.*, 2000.

## Tab. Seroprevalence of Cysticercosis in Bali, 1981-99

Area surveyed	Pop. sampled	Seroprevalence (%)	Reference
Bali		Ranged from 5.2 up to 21	Coker-Vann et al. (1981)
Bali	927	5.3 (ELISA)	Brequet and Ney (1985)
Bali	746	12.6 (Immunoblot)	Theis et al. (1993)
Gianyar	115	5.2 (Immunoblot)	Sutisna et al. (1999)



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**Tab. Seroprevalence of Cysticercosis  
in 9 Districts of Bali, 2002-2009**

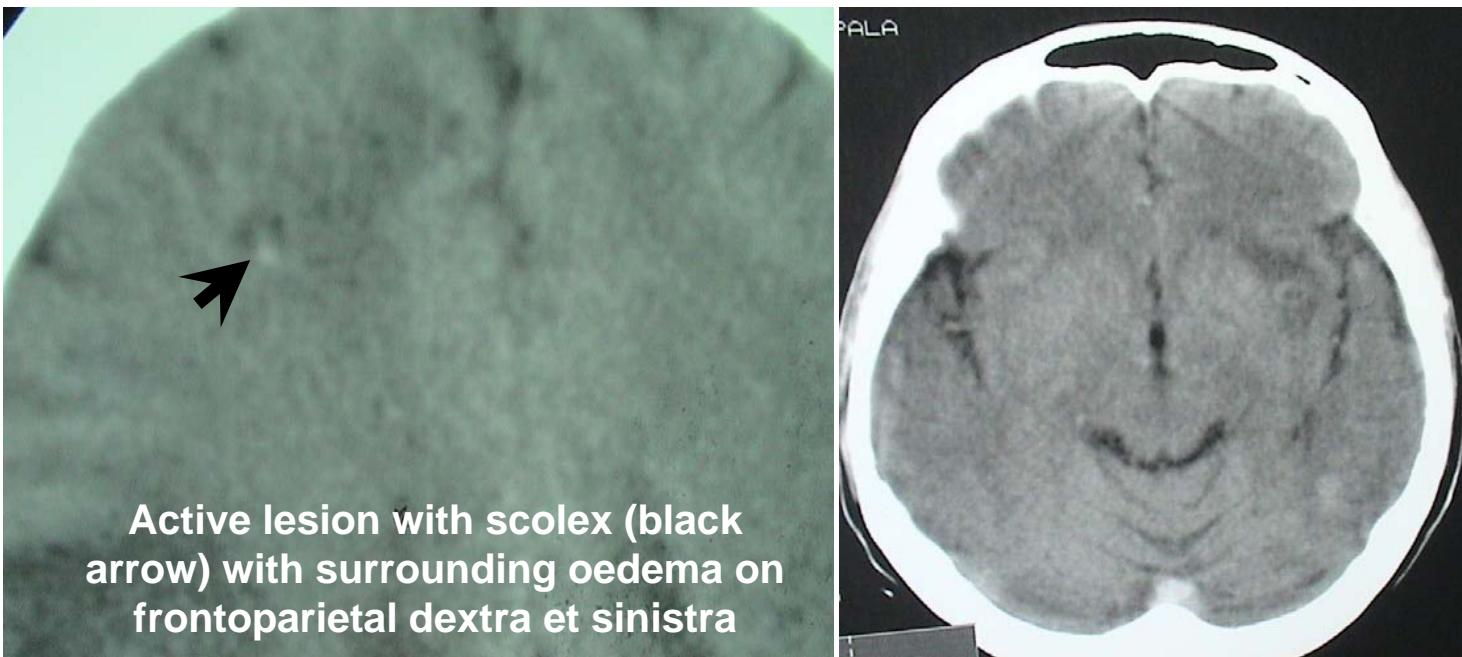
<b>Year</b>	<b>District</b>	<b>Seroprevalence (%)</b>	<b>Reference</b>
<b>2002</b>	<b>Gianyar</b>	<b>0.8 (1/125)</b>	Wandra <i>et al.</i> (2007)
<b>2004</b>	<b>Gianyar</b>	<b>0.0 (0/46)</b>	Wandra <i>et al.</i> (2007)
	<b>Badung</b>	<b>0.0 (0/91)</b>	Wandra <i>et al.</i> (2007)
	<b>Denpasar</b>	<b>0.0 (0/49)</b>	Wandra <i>et al.</i> (2007)
<b>2005</b>	<b>Gianyar</b>	<b>0.0 (0/13)</b>	Wandra <i>et al.</i> (2007)
	<b>Denpasar</b>	<b>0.0 (0/16)</b>	Wandra <i>et al.</i> (2007)
<b>2006</b>	<b>Gianyar</b>	<b>0.0 (0/39)</b>	Wandra <i>et al.</i> (2007)
	<b>Karang Asem</b>	<b>2.8 (1/36)</b>	Wandra <i>et al.</i> (2007)
<b>2007</b>	<b>Bangli</b>	<b>0.0 (0/32)</b>	Wandra <i>et al.</i> , unplished
	<b>Gianyar</b>	<b>4.2 (1/24)</b>	
<b>2008</b>	<b>Jembrana</b>	<b>0.0 (0/84)</b>	Wandra <i>et al.</i> , unplished
	<b>Tabanan</b>	<b>0.0 (0/42)</b>	
<b>2009</b>	<b>Klungkung</b>	<b>0.0 (0/100)</b>	Wandra <i>et al.</i> , unplished
	<b>Buleleng</b>	<b>0.0 (0/47)</b>	Wandra <i>et al.</i> , unplished
<b>2002-9</b>	<b>Total</b>	<b>0.5 (3/660)</b>	16

## Summarized data of *T. solium* Taeniasis SCC, and NCC in Bali, 2003-2009

Area/hospital	Diagnosed	No. of case
<sup>11</sup> Sanglah Hosp, Dps (2003)	Disseminated cysticercosis	1
<sup>12</sup> Sanglah Hosp, Dps (2004)	NCC	2 + with 2 nodules + 1(Sumba)*
<sup>13</sup> Sanglah Hosp, Dps (2005)	NCC	1 with 2 nodules
<sup>14</sup> Gianyar (2007)	NCC (dual infection)	1 with <i>T.saginata</i> taeniasis
<sup>15</sup> Sanglah Hosp, Dps (2009)	NCC	5

<sup>11,12,13, 15</sup>Sudewi *et al.*, unpublished, <sup>14</sup>Wandra *et al.*, unpublished.

# Case 1: A 50-yea-old woman from Bali: NCC with 2 Subcutaneous nodules



Calcified lesion on frontoparietal dextra et sinistra region.

S=Scolex

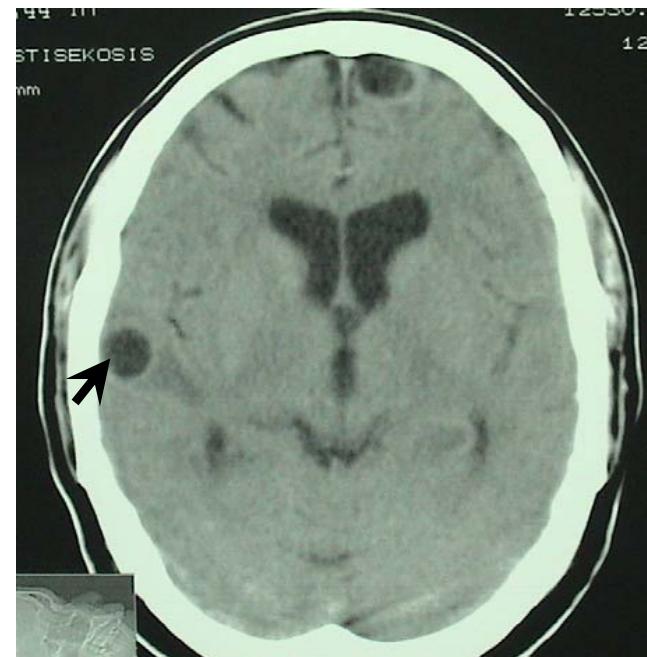
Sc=Spiral canal

Bw=Bladder wall

## Case 2: A 46-year-old man from Sumba, East Nusa Tenggara Province: NCC



Cystic lesions with scolex (black arrow).

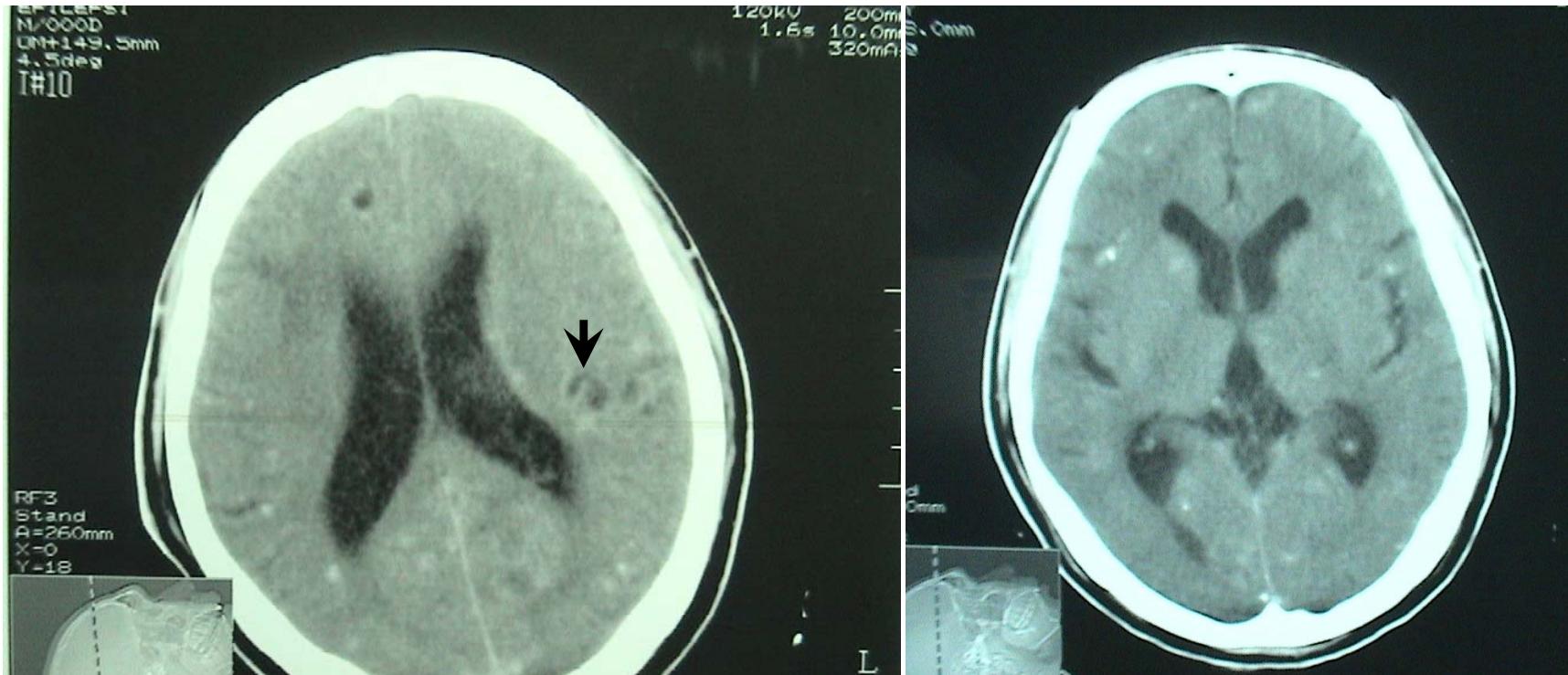


CT scan on 3 month later showed multiple cystic lesions with scolex and one cystic lesion was degraded to calcified lesion (black arrow).

### Serological examination:

- ELISA +
- Immunoblot +

# Case 3: A 31-year-old man from Bali: NCC



Serolo-  
gical  
exami-  
nation:

- ELISA +
- Immuno  
blot +

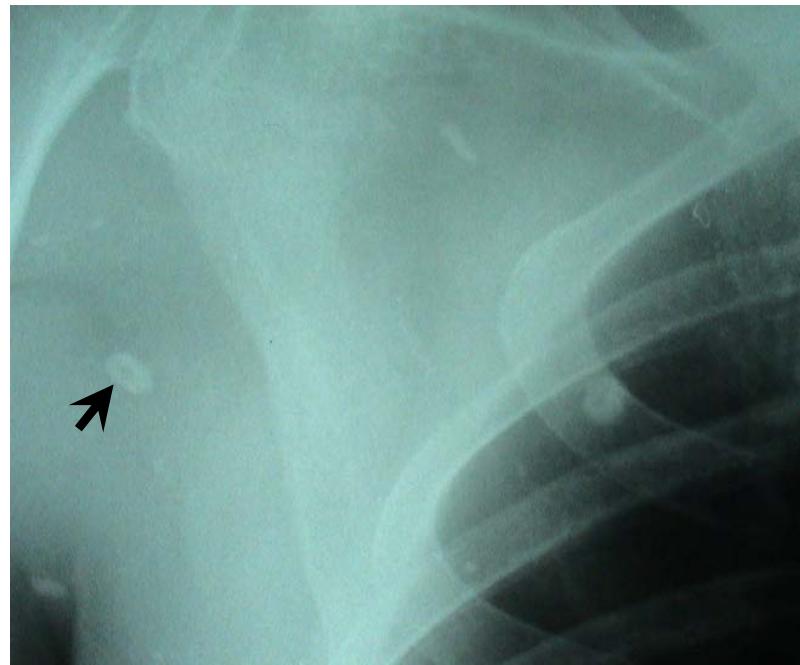
Multiple cystic lesions with scolex  
(black arrow) and multiple calcified  
lesions

CT scan was performed 3  
month later → Cystic lesions  
was disappear and there  
were multiple calcified  
lesions

# Case 4: A 60-year-old woman from Bali: NCC



Calcified lesions



Multiple cigar-shaped calcified lesions

Sero-  
gical  
exami-  
nation:

- ELISA +
- Immuno blot +

## Serological examination by both ELISA (native with different glycoprotein *T. solium* and recombinant antigens) and immunoblot

No.	ELISA OD value, 405 nm			Immu-noblot
	Native antigen Asian genotype <i>cut off</i> =0.051	American genotype <i>cut off</i> =0.071	African genotype <i>cut off</i> =0.072	
1.	0.392 (+)	0.446 (+)	0.307 (+)	0.446 (+)
2.	0.057 (+)	0.191 (+)	0.099 (+)	0.191 (+)
3.	0.338 (+)	0.879 (+)	0.402 (+)	0.879 (+)
4.	0.092 (+)	0.371 (+)	0.122 (+)	0.371 (+)

Wandra *et al*, unpublished

## **Conclusion**

- 1. Bali island is endemic for *Taenia saginata* taeniasis**
- 2. The prevalence of cysticercosis is now very low, sporadic cases are still detected in the hospital**
- 3. Asymptomatic NCC can be induced by treatment with low dose of praziquantel.**

*Thank you*