



# -RXUQDO RI &\WRORJ\ +LVWRORJ\

&DVH 5HSRUW

2SHQ \$F

## \* TPMBUFE 5VCFSDVMPTJT PG 3JC " \$BTF 3FQP

6DQWRVK 7

3DWKRORJ\ DQG /DE 0HGLFLQH 3'&& 'HUPDWRSDWKRORJ\ \$,06 6DNHW 1DJDU %KRSDO 03 ,QGLD  
&RUUHVSRLQLQ&DDWKRORJ\ 3DWKRORJ\ DQG /DE 0HGLFLQH 3'&& 'HUPDWRSDWKRORJ\ \$,06 6DNHW 1D  
ERUQBYVV#\DKRR FR LQ

5HFHLYHG-0DWDU\ \$FFHSWHG)8DWDU\ 3XEOLVKHGHEDU\

&RSULJKW 6DQWRVK 7 7KLV LV DQ RSHQ DFFHVV DUWLFOH GLVWULEXWHG XQGHU WKH WHUPV RI WKH  
GLVWULEXWLRQ DQG UHSURGXFWRQ LQ DQ\ PHGLXP SURYLGHG WKH RULJLQDO DXWKRU DQG VRXUFH D

### \$EVWUDFW

%DFNJURXIDG WXEHUDFXORVLV LV DQ XQFRPPRQ IRUP RI RVWHRDUWLFXODU W\SH R  
FDVHV RI ERQH DQG MRLQW LQIHFWLRQ

&DVH SUHVHQW DUWLFOH D FDVH RI \RXQJ DGXOW ZLWK ULE GHVWUXFWLRQ 7X  
F\WRORJ\ ZLWK &% 1\$\$7 WHVWLQJ 7KHUH ZHUH QR OHVLRQV LQ OXQJ SDUHQFK\|P  
UHVSRLQGHG FRPSOHWHO\ WR WKH DQWL WXEHUDFXORVLV WKHUDS\ ZLWKRXX DQ\ VX

&RQFOXV,VRD DWHG WXEHUDFXORVLV RI ULE LV YHU\ UDUH DQG VKRXOG EH LQF  
H[DPLQDWLRQ )1\$& ZLWK 526( FDQ EH D XVHIXO WHFKQLTXH IRU HDUO\ GLDJQRVLV  
IRUPV WKH PDLQ VWD\ RI WUHDWPHQW ZLWK JRRG UHFryHU\

.HIZRUGWKEHUF XORVLV 5LEV &\WRORJ\ \*HSDSFRQVWPHKXOZDWBQR GRQH IU  
=1 VWDLQ &% 1\$\$7 QHJDWLYH +LV VHUXP \$\$ OHYHOV ZHUH F

\$EEUHYLDSWLRQGHQRVLQH 'HDPLQDVH 22QV\$X\ &HWULGJH ZDV GRQH RQ ULJKW I  
%DVHG 1XPSLQFL\$DNLVQ)1\$& )LQH 1HGLQGHUWVWLRQ YLUDO PDLQURGH+RFB  
&\WRORJ\ +&9 +HSDWLWLW, &PXLQGH)F\HUXPD+HSDWLWLW % +HSDWLWLW & ZH  
9LUXV 0VREDFWHULXP 3XEHUFDQVWVXFLRQ RI FROG DEVFHVV IXQJDO OHV  
7XEHUDFXORVLV IURP ORFDO VLWH ULE

### ,QWURGXFWRQ

,Q GHYHORSLQJ FRXQWULHV OMNHQ,06DD WXEHUDFXORVLV 7% LV D  
SXEOLF KHDOWK UHURFOHPEHKLQG WKLV LV ZLGHVSUHDG  
LPPLJUDWLRQ PDOQXWULWLRQ DQG ORZ LPPXQH VWDWXV > @  
OXVFXORVNHOWDO WXEHUDFXORVLV DFFRXQWV IRU RI DOO H[WUD SXOPRQDU\  
ORFDOL]DWLRQV > @ 5LE WXEHUDFXORVLV LV DQ XQFRPPRQ IRUP RI  
RVWHRDUWLFXODU W\SH RI WXEHUDFXORVLV DFFRXQWLQJ IRU RI FDVHV RI ERQH  
DQG MRLQW LQIHFWLRQV@FDQ SUHVHQW DV LVRODWHG OHVLRQ  
ZLWKRXX DQ\ SULPDU\ IRFL LQ WKH OXQJ SDUHQFK\PD RU RWKHU ULEV :H  
KHUHE\ SUHVHQW D FDVH RI LVRODWHG WXEHUDFXORVLV RYHU SRVWHULRU WK UI  
WKH LQLWLDO SUHVHQWDWLRQ ZLWKRXX DQ\ OHVLRQ LQ WKH OXQJV

### &DVH 5HSRUW

\$ \HDU PDOH SDWLHQW SUHVHQWHG WR PHGLFLQH FOLQLF ZLWK FRPSODLQWV  
RI WHQGHUQHVV RYHU ULJKW EDFN IRU PRQWKV \*HQHUDO H[DPLQDWLRQ  
UHYHDOHG D VZHOOLQJ RYHU ULJKW LQIUDVFDXODU UHJLRQ \$V )LJXUH D VKRZ  
KH KDG QR O\PSKDGHRSDWKH &ZKHSDRWRVSOHQRPDJDO\  
KLVWRU\ RI DQ\ 7% FRQWDFW RI WKH SDWLHQW &KHVW ; UD\ UHYHDOHG D O\WL  
OHVLRQ LQ SRVWHULRU SDUW RI WK ULE UHYV RI OXQJ SDUHQFK\PD ZDV GRUPLD  
+LV FRPSOHWH EORRG SLFWXUH UHYHDOH\ &HWULGJH ZLWV JGCEFWBWOFRX  
OHXFRF\WH FRXQWLVHUH &HWULGJH UHYHDOHG PLOGXODU UHJLRQ PHDVXULQJ DSSU  
HRVLQRSKLOLD (U\WKURF\WH VHGLPHQWDWLRQ UDWH (65 PP VW KU =HLO UL  
1HHOVRQ =1 VWDLQ IRU DFLG IDVW EDFLOOL ZDV GRQH IURP WKH VSXWXP  
VDPSOH IRU WKUHH FRQVHFXYLYH GD\V DQG ZDV QHJDWLYH &DUWULGJH EDVHG  
QXFOHDQ SDGLFQDWLRQ LTXH &% 1\$\$7 ZDV GRQH XVLQJ WKH



3DJH RI

&RQFOXVLRQ

6KDK%\$ 6SODLQ 6 0XOWLIRFDO RVW  
2UWKRS DHGLFV  
,VRODWHG WXEHUF XORVLV RI ULE LV UD...  
GLVHUHQ\WLFDO\LFDO H[DPLQDWLRQ )1\$& FDG...  
IRU HDUO\ GLDJQRVLV DQG VWDUW RI DQW...  
PDLQ VWD\ RI WUHDWPHQW ZLWK JRRG UH...

5HIHUHQFHV

:LHE (OZRRG 5. 7XEHUF XORVLV RI WK  
FDVHV 5HVSLU OHG  
.HQ\ 6- 7XEHUF XORVLV RI ULE ZLWK FRO  
\*DXG16 5H1DV \$. 7XEHUF XORVLV RI WK...  
SXOPRQDU\ LQYROYH PHQW /XQJ ,QGLD  
ORXKW\SCDU6NHGRXQQH 7XEHUF XORVLV RI...  
ORQWKdV 2OG %R\ 0...  
1LW5D 'HYDQDQG & 6DEUL 0\$ <XJHVK \$ 3U...  
2VWHRP\HOLWL V RI ULE \$Q XQXVXDO IRU...  
,QWHUQDWLRQDO -RXUQDO RI OHGLFDO 6F...  
/HH< 'LDJQRVLV DQG 7UHDWPHQW RI ([WUDSXOPRQDU\ 7XEHUF XORVLV  
7XEHUF 5HVSLU 'LV